

Construction Methods AND EQUIPMENT

JULY, 1959

PRICE \$1.00

A McGRAW-HILL PUBLICATION

***15 service experts
talk about the
maintenance of...***

- 1 CRAWLER TRACTORS
- 2 GRADERS
- 3 SCRAPERS
- 4 ROLLERS
- 5 COMPRESSORS
- 6 TRENCHERS
- 7 CRUSHERS
- 8 TRUCKS
- 9 CRANES
- 10 ASPHALT PLANTS
- 11 LOADERS
- 12 AIR TOOLS
- 13 PAVERS
- 14 ROCK DRILLS
- 15 WHEEL TRACTORS

"5-6 times longer rope life drilling 1560 holes"

John Holman, Mgr.
Contractors Foundation Drilling Co.
Fort Worth, Texas

Holes drilled per line of ordinary rope: 8 to 10. Holes drilled per line of Yellow Strand "POWERSTEEL": 50! This job is tough on wire rope — but high-strength, longer wearing "POWERSTEEL" is especially made for jobs like this. Let Manager John Holman tell the story in his own words:

"Our contract with Tarrant County Water Control District No. 1 required drilling 1,560 holes, each 45" in diameter and 33' deep, backfilling with clay and compacting to provide a continuous impervious wall. The contract further provided for completion in 180 calendar days.

"Our method of operation required a machine to drill the hole, backfill and compact. Unusual wear and fatigue caused excessive breaking of various brands of wire rope, often requiring two to three 225' rope changes per day. With $\frac{1}{2}$ " 6 x 25 'POWERSTEEL' we reduced rope breakage to one 225' length approximately every 30 days.

"We realized substantial savings in rope cost, man-hours and down time, all of which were instrumental in completing our contract approximately 45 days ahead of schedule."

Contact your nearest Broderick & Bascom Distributor for "POWERSTEEL" help on your tough jobs. Broderick & Bascom Rope Co., 4203 Union Blvd., St. Louis 15, Mo.



Yellow Strand®

"POWERSTEEL"®



WIRE ROPE



SLINGS



CLIPS

B.F. Goodrich



B.F. Goodrich tires handle the tough jobs at mammoth Niagara Power Project

UNDER construction at Niagara Falls, N.Y., are the powerhouse, waterways, reservoir and intake—all part of the gigantic \$720-million Niagara Power Project. Shown above: site of 110' x 50' excavation for one of the twin, 46'-wide, covered intake conduits. On the job: a fleet of trucks equipped with B.F. Goodrich tires and owned by Merritt-Chapman & Scott Corporation, largest contractor on the project.

These trucks haul ton after ton of rock and overburden from the excavation to the spoils area, work round-the-clock, 6 days a week, under severe operating conditions. In spite of this, B.F. Goodrich Rock Service tires are still going strong after 3,135 hours of service!

The Rock Service tread is specially-compounded to resist rock cuts and snags. Massive double-chevron cleats give extra traction in forward or reverse. Thanks to the special B.F. Goodrich FLEX-RITE NYLON cord body, Rock Service tires are virtually immune to heat blowouts and flex breaks. Result: you get longer tire life—more retreadable tires!

Other B.F. Goodrich products at work on the Niagara Power Project are conveyor belting, air hose, protective clothing and footwear. Maintenance and service programs for tires and industrial products are also in operation—all part of the new B.F. Goodrich Unified Contractor Program. No matter what your off-the-

road job, B.F. Goodrich is ready to serve you—and help you save. Your Smileage dealer is listed under Tires in the Yellow Pages of your phone book. The B.F. Goodrich Co., Akron 18, Ohio.

Specify B.F. Goodrich Tubeless or tube-type tires when ordering new equipment



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B.F. Goodrich off-the-road tires

Job Finished 3 Weeks

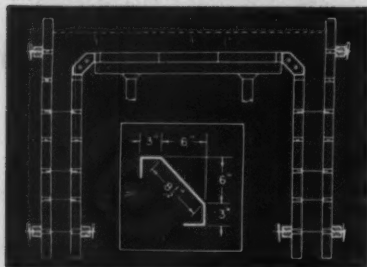


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Construction Methods AND EQUIPMENT

JULY, 1959

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To give you the right rope for your equipment, each Whyte Strand wire rope is internally lubricated and designed to provide the right combination of toughness, flexibility, and abrasion resistance to assure maximum service.

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Manufacturers of shovel hoist rope, dragline, clamshell crane rope, boom hoist line, dozer rope, scraper rope, contractor's hoist and derrick rope, and winch line.

JULY, 1959

Equipment Maintenance Guide

15 Service Experts Talk About Maintenance of...

CRAWLER TRACTORS	88
MOTOR GRADERS	92
SCRAPERS	96
ROLLERS	102
COMPRESSORS	114
TRENCHERS	125
PORTABLE CRUSHERS	132
SHOVELS and CRANES	143
OFF-HIGHWAY TRUCKS	153
ASPHALT MIXERS and PAVERS	158
PAVERS	166
TRACTOR-SHOVELS	170
ROCK DRILLS	181
AIR TOOLS	191
WHEEL TRACTORS	201

Including 14 pages of comparative specifications

CRAWLER TRACTORS	90
MOTOR GRADERS	94
TRACTOR-DRAWN SCRAPERS	99
SELF-PROPELLED SCRAPERS	100
STEEL ROLLERS	106
PNEUMATIC-TIRED ROLLERS	110
COMPRESSORS	116



THIS MONTH

Symbolic of our preventive maintenance theme is the cover background picture showing a hydraulic hose fitting being tightened. Loosened, on the other hand, are the pages of this issue: they are all perforated. Thus you can easily remove them for filing and reference in the months to come.

DEPARTMENTS

Construction News	
From Washington	17
Job Talk	25
Trends in the Machinery Market	43
Construction Business	52
Picture of the Month	63
Construction News in Pictures ..	77
Editorial	87
Sales and Service	210
Construction Equipment News ..	216
New Publications	246
Methods Memo	254

NEXT MONTH

The rampaging Ohio River twice last spring flooded a cofferdam enclosing the first stage of construction on New Cumberland Dam at Stratton, Ohio. The floods held up work for almost a month altogether, but good management and methods on the part of the contractor, Dravo Corp., Pittsburgh, Pa., has put the job back on schedule.

RUGGED

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rugged is the word for this new 90-M!

Put this new "80" Series pump on the job anywhere . . . this is what you've got! *Amazing performance, proved time after time. Higher*

suction lifts, and peak efficiency, resulting from Gorman-Rupp's patented design. Fast starts, surer starts—with high speed repriming.

Dependability, backed by Gorman-Rupp. Isn't it time you tried one of the new "80" Series Pumps? They're available now.

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305 Bowman Street

Manfield, Ohio

**CAN
YOUR
PLANT
BIG AS
IT MAY
BE**

PRODUCE AS MUCH CONCRETE AS THIS

This BUTLER Central Mixing Plant is simply the extremely portable HP-85 Ready Mixed unit with an additional section to accommodate two turbine-type, high speed concrete mixers.

Production? In excess of 200 yards an hour!

The batching cycles are completely automatic; only one man operates batchers and mixers.

Where such capacities are not required, the BUTLER HP-85 can readily be built for a single turbine mixer.

The HP-85 is ideal for fast, efficient, low-cost batching in commercial ready mixed operations as a permanent plant — or as a unit that can be moved quickly and economically from job site to job site. The cost of erecting is only about a thousand dollars.

And of course, the HP-85 brings all its benefits to pre-cast and pre-stressed concrete operations.

Due to the BUTLER HP-85's remarkable portability, a growing number of ready mixed operators are using it to enter the Highway Program — using either agitating or non-agitating trucks.

What are your plans? In any case, plan for the profit-making BUTLER HP-85.

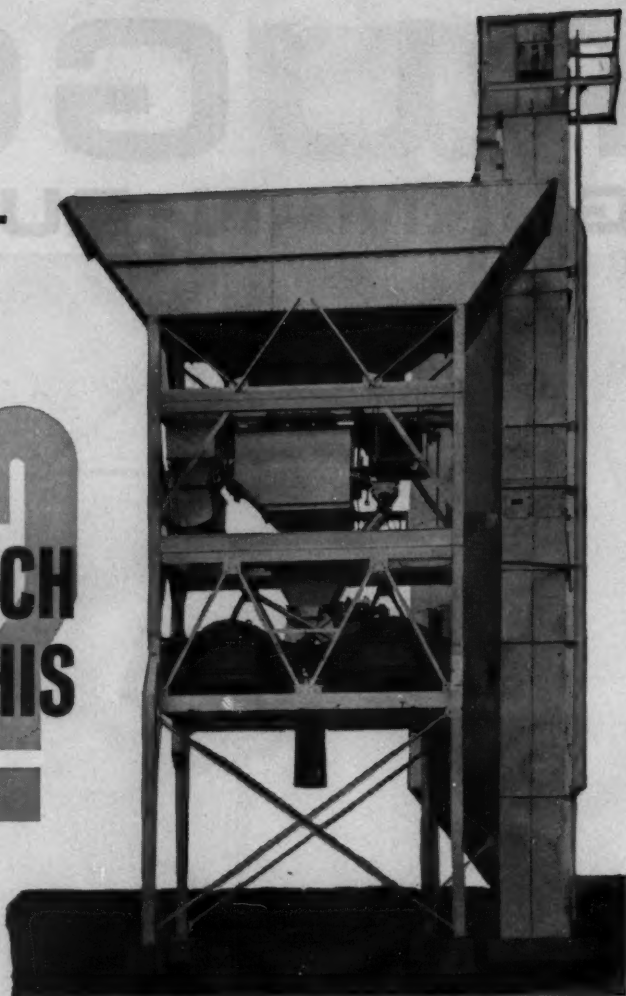
**Here's the reason the HP-85 is erected at
lowest cost . . . in hours instead of days**

You'll want to know more about the BUTLER HP-85. Send for this illustrated Bulletin. Just write "HP-85" with your name and address on a postcard. We'll do the rest — promptly!



BUTLER BIN COMPANY

949 BLACKSTONE AVE. • WAUKESHA, WIS.



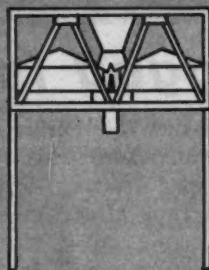
• The compartmented bin section ships complete with lugs attached for crane lift.



• Batcher section is a complete unit with all piping, wiring, batchers and automatic controls in place, ready for plug-in.



• Mixer section is also a complete unit with two turbine mixers, gates and controls pre-installed. Circuitry is completed with plug-in quick connectors. Support columns ship separately. These are quickly pinned to the mixer platform and swing into place as the mixer section is raised.



**Whether it's
TOUGH DIGGING or
JUST PLAIN DIRT—**

**NORTHWEST PULLSHOVELS
make it
EASIER!**



THERE IS a
Northwest Pullshovel of the
right capacity to handle *any* ditch-
ing job you face. From the 2½-yd. 95
down to the ¼-yd. 25-D, there is a size to
answer your problem, whether it is reach,
capacity or ability in tough digging or rock —
and they're proved in years of service.

The Northwest 95 has a reach of 51 ft. It will bottom
out at 32 ft. It brings you the pullshovel attachment
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equipment. Dippers fill easily and dump cleanly. Booms
raise high to clear trucks without banging side boards or
spilling. Heavy-duty crawlers have been proved in miles of
travel often encountered in pullshovel work. The "Feather-
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true feel of the load and without the complications of
pumps, compressors and other delicate mechanisms.

These and many other advantages assure high output,
whether it's deep ditch, shallow ditch, narrow
ditch, wide ditch or rock digging. There is a lot
more you should know about. Ask a
Northwest man to bring you up-to-date.



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1/4 to 2 1/2 yd.
Capacity

CRAN
1/2 to 10 yd.
Capacity

REACHING
1/4 to 10 yd.
Capacity

PULLSHOVEL
1/4 to 10 yd.
Capacity

TRUCK CRANE
1/2 to 10 yd.
Capacity

YARDS AHEAD

CW-226
A COMPL



MODEL CW-226

2-axle, self-propelled scraper designed for rated capacities of:

26.0 Cu. Yds. Struck

36.0 Cu. Yds. Heaped

Travel Speeds	to 34.4 m.p.h.
Load Capacity	78,000 lbs.
Interchangeable with	21 Cu. Yds. Struck
Curtiss-Wright model	31 Cu. Yds. Heaped
CWD-221 Rear Dump	70,000 lb. Capacity

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SOUTH BEND
SOUTH BEND,

26... NEWEST AND LARGEST OF COMPLETE LINE OF EARTHMOVERS!

The 26 yd. CW-226 is the newest and largest addition to the Curtiss-Wright line of self-propelled scrapers . . . and the newest and largest *practical* unit for your job. It's a *high speed* machine with *exclusive* Curtiss-Wright "Roto-Gear" steer and 375 h.p. engine for the maximum in speed and control!—A *high output* machine combining all the tested and proven features that give heaped loads, smooth spreading and fast cycles—A *dependable* machine with rugged basic design and unit construction for long life and simplified maintenance . . . All these features put the Curtiss-Wright CW-226 years ahead in design—yards ahead on the job, and put YOU dollars ahead on the profit sheet . . . see it in action!



**T CORPORATION
DIVISION
INDIANA**





HARBERT USES TEXACO 100% ON FLORIDA PIPELINE PROJECT

TEXACO PLAN **makes mobile lube rig a** **complete service station**

**Harbert Construction Corporation, Birmingham, Alabama,
cites fine performance record of Texaco lubricants**

Although their work on the natural gas pipeline for Florida ranges over 1,000 miles of pipeline, Harbert Corporation's equipment is never out of reach of complete lubrication. The reason: mobile lubrication rigs. And with the Texaco Simplified Lube Plan, each rig is completely equipped to service any lube point on any machine, wherever it's working. There's no time lost deadheading equipment back to a fixed service center. As a result, all equipment gets proper lubrication at the right time.

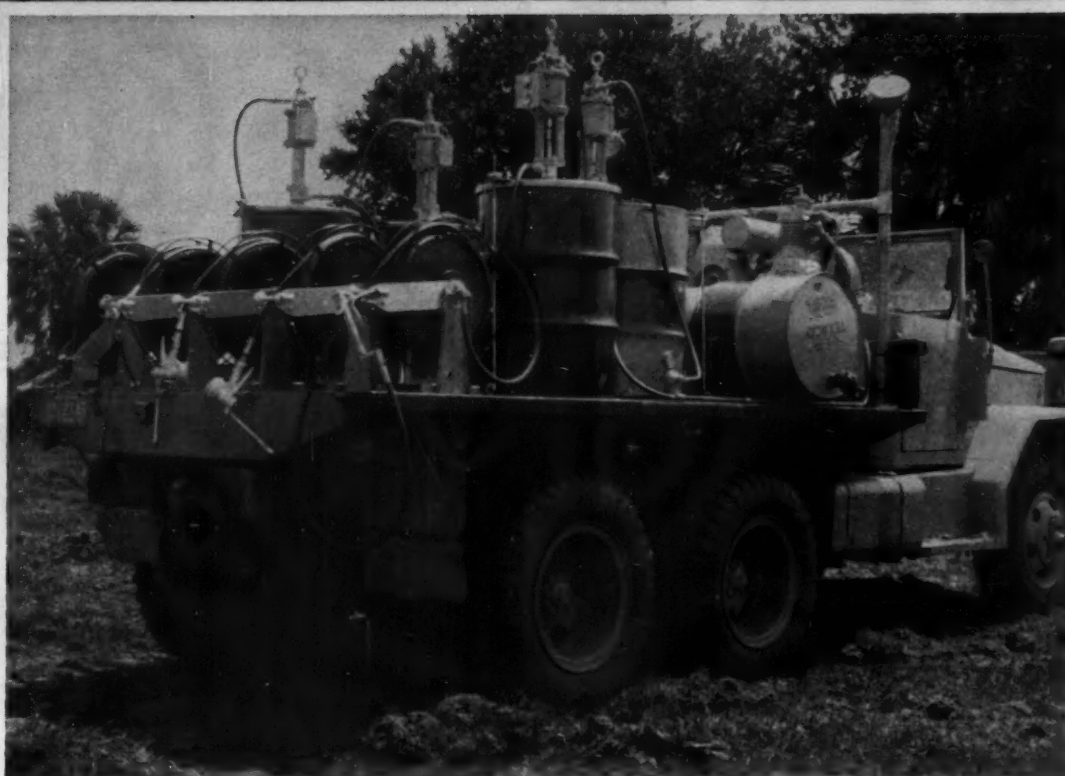
Systematic lubrication is easier with the Texaco Plan, too. The Texaco Plan indicates

clearly what lubricant goes where, and how often, so equipment delivers peak performance. And simplified inventory saves man hours in storage and handling, cuts the chance of lubricant misapplication.

A Texaco Simplified Lubrication Plan can cut costs and boost performance on your next project. Just call the nearest of the more than 2,000 Texaco Distributing Plants, or write:

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Texaco Inc., 135 East 42nd Street, New York 17, New York.



COMPLETE SERVICE, ANYWHERE,

is possible with a mobile rig and a Texaco Simplified Lube Plan. A Texaco Plan cuts inventory so you can put every lubricant you need for every machine on a single truck.



LUBRICATION IS A MAJOR FACTOR IN COST CONTROL
(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)



Maintaining haul roads in Minnesota



Mixing black-top in Idaho



Widening a highway in Oklahoma

Top GRADE MEN



Leveling a haul road in Indiana



Spreading fill in Alabama

choose Allis-Chalmers



Trimming up a haul road in Mississippi



Grading a road in Florida

When selecting motor graders for your next job, consider this swing to the FORTY FIVE . . . then check this combination of features available only in Allis-Chalmers motor graders:

- ROLL-AWAY moldboard, an Allis-Chalmers exclusive, reduces friction by moving the load up and ahead of the board . . . handles more material per horsepower than any other make.
- High-arch front axle clears big windrows . . . reduces axle dozing that hampers steering and cuts production.
- Extra high throat clearance accommodates big rolling loads without jamming material against the circle.
- Toggle-type controls, another Allis-Chalmers exclusive, give operators positive control . . . eliminate wrist-snapping backlash.

move ahead with ALLIS-CHALMERS
...power for a growing world



Maintaining logging road in Washington



Finishing a cut in Nebraska

N all over the country



Fine-grading base material in Oregon



Removing rough spots on a haul road in Colorado

s **FORTY FIVE** motor graders



Maintaining a haul road in Illinois



Rough grading a turnpike in Texas

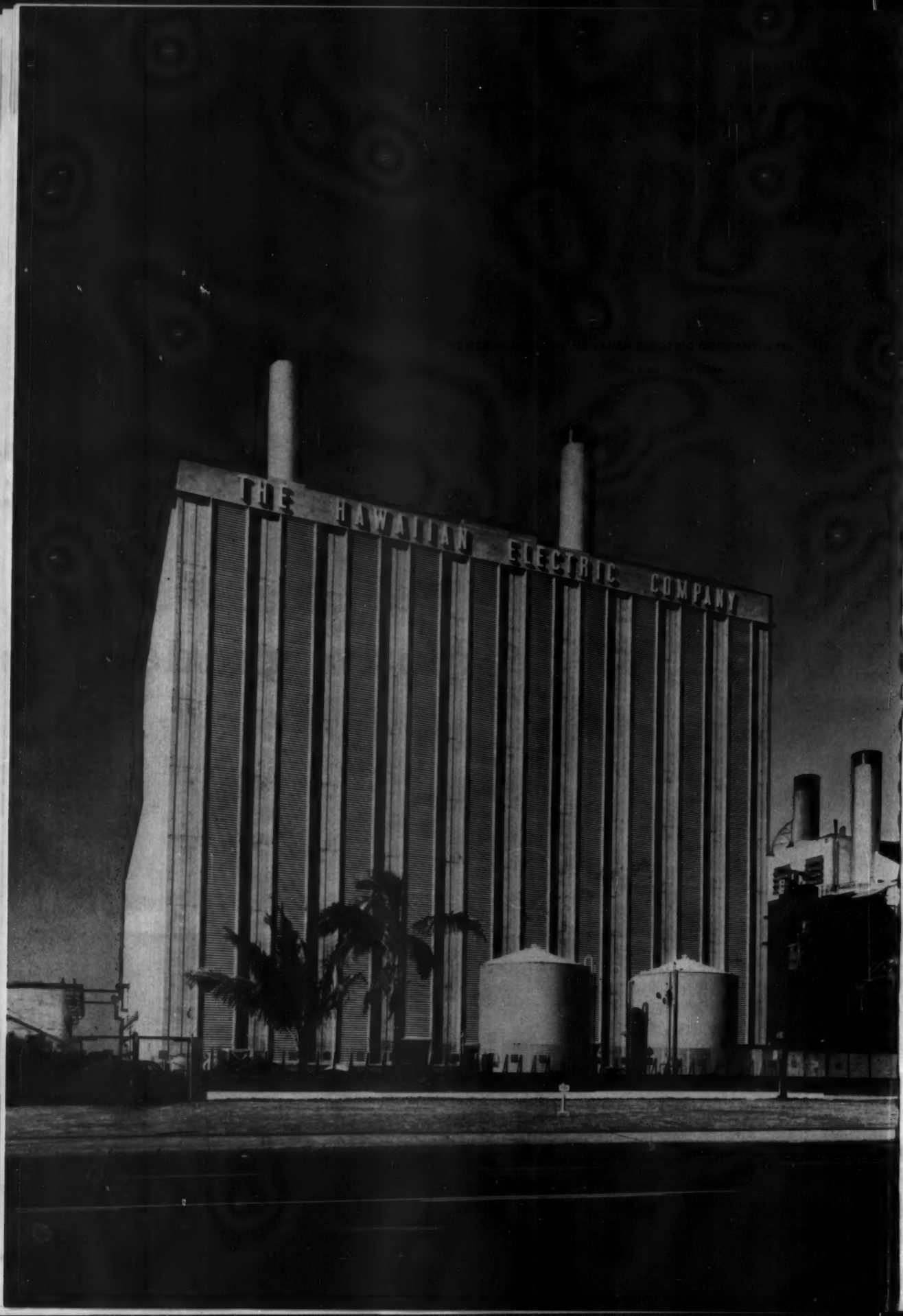
Your Allis-Chalmers dealer will arrange for you to try these and the many other features that make the Allis-Chalmers FORTY FIVE your best BIG grader buy. Tell him to get the date. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



ROLL-AWAY is an
Allis-Chalmers trademark.



FORTY FIVE motor grader
127 horsepower
6 speeds forward to 20.6 mph
3 speeds reverse to 7.0 mph
23,800 lb (approx)



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ENGINEERED BY THE HAWAIIAN ELECTRIC COMPANY, LTD.

1934 - 1935 - 1936

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COMPLETE CONSTRUCTION SERVICES ABROAD

CONCRETE PERFORMANCE REPORT:

Pozzolith employed to meet full range of engineering requirements for all types of concrete specified

This job involved some 800,000 cubic yards of concrete. The Air Force Academy Construction Agency and the architects—Skidmore, Owings and Merrill—jointly supervised all construction and established an on-site concrete materials control laboratory. During July and August, 1956—with only a few thousand yards of concrete placed—they observed erratic and low compressive concrete strengths. The wide range and rapid changes in temperature were suspected as the cause.

AERIAL VIEW of nearly completed Air Force Academy. Construction under supervision of the Air Force Academy Construction Agency. Architects: Skidmore, Owings & Merrill, Chicago • Over 24 contractors were engaged in major concrete work. Ready-mixed concrete was supplied from central batch plants operated by: Concrete Materials, Inc., Kansas City • General Concrete Co., Colorado Springs • Transit Mix Concrete Co., Colorado Springs.

AIR FORCE ACADEMY



CONCRETE RETAINING WALLS reach 36 feet high over much of the 10,000 foot length. Walls required a placeable mix of 2" to 4" slump with design strength of 3,000 psi.

COMPREHENSIVE TESTS were made and established that POZZOLITH would provide uniform, high strength throughout the wide range of temperature changes experienced between early morning concreting at about 50°F and mid-day concreting at 75° to 80°F. In September 1956, POZZOLITH was first employed in concrete at the Academy. The successful performance here led engineers to investigate the use of POZZOLITH for control of other classes of concrete—including lightweight aggregate concrete, prestressed concrete and structural concrete. *As a result of this investigation, POZZOLITH and only POZZOLITH was used as the water-reducing, set-controlling admixture for the project.*

POZZOLITH was used in over 750,000 of the 800,000 cubic yards of concrete at the Air Force Academy. For each of the many classes and types of concrete specified—it provided the required batch-to-batch uniformity, most economically, for the broad range of job requirements and varied climatic conditions encountered at the site.

The Master Builders field men worked closely with project engineers, the field control laboratory, contractors, and concrete suppliers at the Air Force Academy to achieve the common goal of uniform, superior quality concrete at lowest cost-in-place.

Write for your free copy of the detailed "Air Force Academy Concrete Performance Report".



PRESTRESSED CONCRETE BRIDGE GIRDERS required compressive strength of 4,500 psi before application of stress. The POZZOLITH mix provided initial retardation for good consolidation in the form, yet accelerated early strength producing 6,500 psi in 7 days.

The Master Builders Co., Cleveland 3, O.
Division of American-Marietta Co.
The Master Builders Co., Ltd., Toronto
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Branch Offices in all principal cities.

MASTER BUILDERS POZZOLITH*

*POZZOLITH is a registered trademark of The Master Builders Co. for its concrete admixture to reduce water and control entrainment of air and rate of hardening.

Construction News From Washington

Washington, D.C.
July, 1959

Construction in Congress

The outlook for Federal spending on construction has changed completely since the first of the year. When the Democrats took over both houses of Congress last fall, with majorities reminiscent of New Deal days, they promised whopping public works programs.

The list of the programs they proposed was impressive. It included hundreds of millions of dollars for such programs as these: Federal aid to cities for pollution control, Federal aid to airports to meet the needs of the jet age, Federal aid to economically depressed areas, an expanded housing program, Federal funds for school construction, and bigger appropriations for the multi-billion bundle of river and harbors and flood control projects.

But now—as Congress gets down to the closing weeks of the session—it's clear that Pres. Eisenhower's views on construction programs are prevailing.

Biggest single reason for this turnaround is the end of the recession and the beginning of what appears to be a solidly based business boom. This took from the Democrats the argument that counted most on the side of heavier Federal spending for public works of all kinds—the boost such spending would give a national economy plagued with unemployment.

The President, during all this time, stuck doggedly to his position that a business recovery could be achieved without budget-busting Federal public works spending.

The threat of a veto of Democratic "big spending" programs has forced the Democrats to cut down many programs. Here's a run-down:

Airports

Federal grants for airport construction will be frozen at current levels for two more years. Congress has authorized grants of \$63 million in both fiscal 1960 and 1961. This represents a clear-cut victory for Pres. Eisenhower. When the Democratic Congress met in January, its leaders were confident they could push through a four-year, \$465-million airfield construction program. But the White House fought hard for its own \$200-million airport bill. Faced with the threat of a veto, the lawmakers settled for the stop-gap measure, freezing the program at its present \$63-million level. Now the Federal Aviation Agency must decide which communities need the money the most.

Military Construction

Administration plans to trim spending for military construction will be carried out, despite talk earlier in the year that Congress would jack up the defense budget. The outlook now is for \$1.6 billion of new

Construction News from Washington... continued

contract awards in fiscal 1960, starting July 1. That is \$400 million less than last year.

Under Congressional pressure, the Pentagon also is reshuffling its construction plans. At least five new bases (cost \$10 million to \$13.5 million each) planned for the Air Force Bomarc anti-aircraft missile will not be built. At least seven new Army bases (about \$2 million each) planned for the Nike-Hercules anti-aircraft missile also are being cut from the program.

The Air Force program for Atlas and Titan ICBM bases (roughly \$50 million each for most installations) seems likely to go forward much faster than the Pentagon originally planned. Eleven sites already have been picked; as many as 10 more will be selected later. These new bases also will be more elaborate—and more costly—than those built to date. For one thing, they will be largely underground. In addition, launching sites will be more widely dispersed than previously.

The Air Force also is shifting to underground construction for Air Defense Control Centers. The last six of the 29 centers will be underground. That will double the \$8-million construction costs for each center.

Atomic Power

Congress is marking time with the atomic energy program, too. Public power Democrats had hoped to push through a big program of reactor construction. But Congress has voted to authorize only \$164.4 million for new plant construction. That compares with an average of \$300 million a year during the past several years.

The measure includes nine new reactors—none of more than moderate size. Congress put off until next year a decision on whether the government should give capital grants for private utility construction of power reactors. On the positive side, there is no opposition in Congress to the President's request for approval of a \$105-million high energy linear accelerator to be built at Stanford University. The project, being handled in separate authorization legislation, may be the first of several high research facility projects.

Public Works

The House has approved a public works appropriation bill—for rivers and harbors, flood control, and reclamation projects—that calls for total spending of \$1.2 billion. That's almost exactly the amount the President asked Congress to vote.

The House bill provides funds to start construction of 38 new projects and money to begin planning 12 more that were not included in the Administration program. To counterbalance this, the bill defers construction or planning of six projects the Administration recommended and cuts the requested funds for 25 others now in the planning or construction stage.

Best Protection against Rust and Corrosion

Goodyear Rims with
exclusive Bond-a-Coat
finish



This Rim was
protected by
Bond-a-Coat
process

Note condition of rims after standard 48 hour
ASTM salt-spray test. Exclusive Goodyear process
thoroughly prepares the raw metal surface.



This Rim
was Not

The above pictures clearly show the protective effect of Goodyear's exclusive process—Bond-a-Coat.

This unique finish—originally proved on Goodyear Agricultural Rims—keeps rims from rusting. More than that, it protects tires, too—helps you get maximum mileage out of every tire you buy.

Bond-a-Coat is just one of the reasons why you'll find it pays to specify Goodyear Rims, both for replacement and on new equipment. Some of the others:

Unusual strength: Thanks to special designs and closer tolerances, bal-

ance and alignment are greatly improved. As a result Goodyear's present-day rims are suited for today's needs.

Job-Fitted: Goodyear Rims are job-fitted. Result: less tread cracking, tread wear, reduced sidewall and bead failure.

Special tools: Goodyear provides both hydraulic and hand tools especially made for modern equipment.

Talk it over with your local Goodyear Rim Distributor. He'll help you pick out the type and size of rim best suited to your needs. Or write:

Goodyear, Metal Products Division,
Akron 16, Ohio.



This is how Goodyear stores its rims—
outdoors—thanks to Bond-a-Coat.

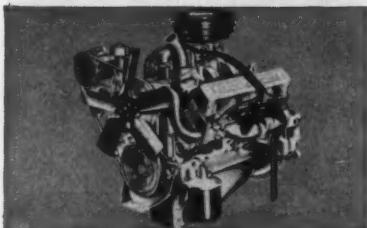
Your tires go farther on RIMS by

GOODYEAR

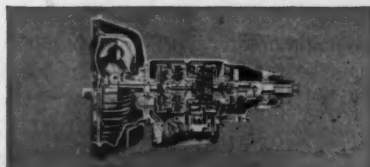
MORE TONS ARE CARRIED ON

GOODYEAR RIMS THAN ON ANY OTHER KIND

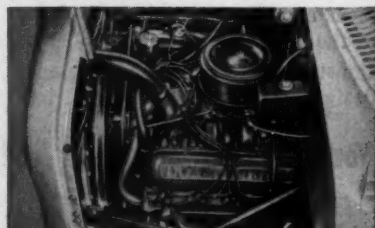
Take a haul 20 miles each way



Harder working! Low-stress 345 cu. in. V-8 engine is proved to operate at maximum rpm. By-pass cooling and alternating valve system give long compression life. Special contour piston and combustion chamber creates high turbulence and even burning.



Surer working! INTERNATIONAL Trucks Select-O-Matic semi-automatic transmission torque converter is designed around major components of precision cast aluminum. Mirror smooth hard shell surfaces provide over 90% efficiency...intake oil filter assures they stay that way. **IMPORTANT!** Conventional design gear setup simplifies maintenance for any mechanic.



Easier servicing! V-8 engine measures only 31 in. long. There's no "dog house" or cramped working space in the cab. All servicing is done under the hood... every component is readily accessible. Fast access to standard parts and service cuts downtime.

V-8 POWERED INTERNATIONAL

racks up
2 extra trips
per day!

Try an INTERNATIONAL V-8 powered truck on your job—this compact-design tandem-axle model, for instance. It gives you the newest, most advanced combination of V-8 engine and semi-automatic transmission in the business. There's perfect unit-to-job balance for application in hilly country or flat, whether you're dumping near the job or miles away!

The husky, all-truck V-8 power plant—345 cu. in. displacement—has a power range with the guts to pull out of a "hole" or pull ahead on the highway.

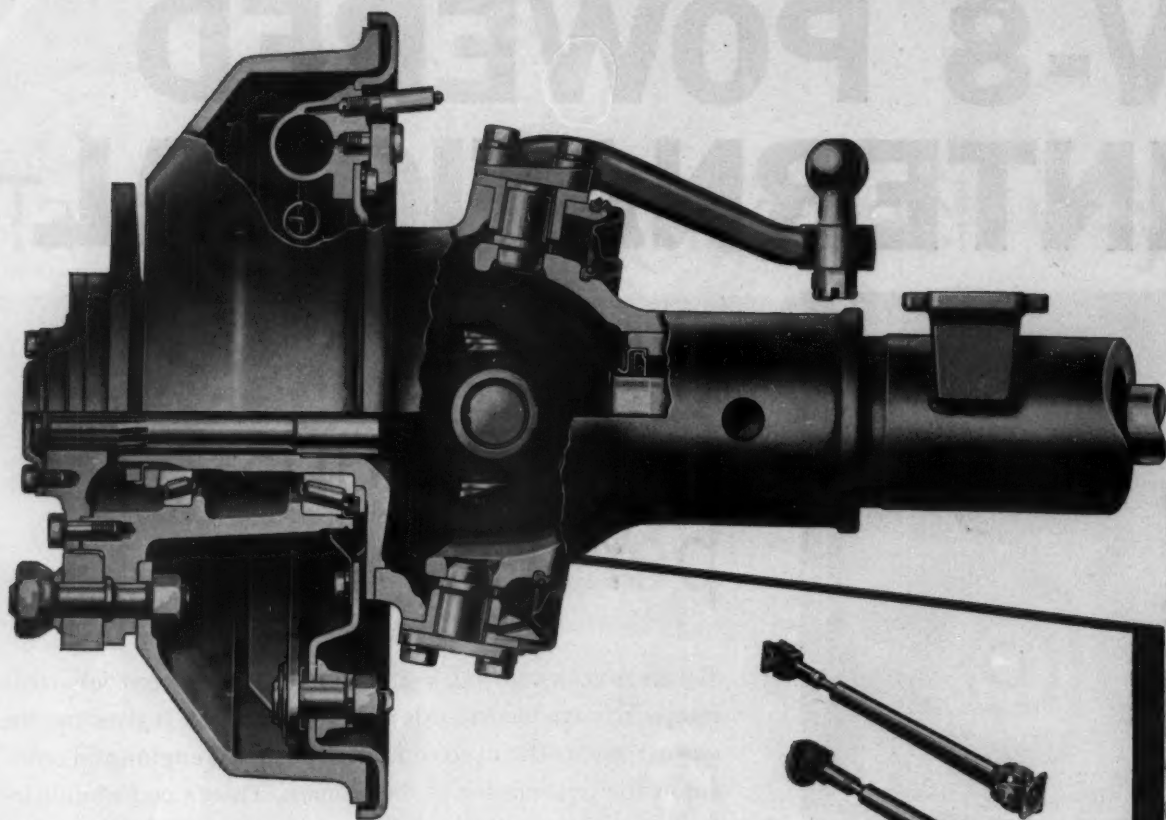
Optional Select-O-Matic semi-automatic transmission tames every ounce of power to give driver complete ease of control and smooth application of power no matter what the conditions. Shock-load to rear axle is virtually eliminated.

Get the whole story on this 33,000 lb. GVW unit or on other INTERNATIONAL models to do your job and do it faster. See your INTERNATIONAL Dealer today!

INTERNATIONAL® TRUCKS

WORLD'S MOST COMPLETE LINE

International Harvester Company, Chicago • Motor Trucks • Crawler Tractors • Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors



**For a better front-driving axle,
get this Timken-Detroit FDS-750
equipped with
BLOOD BROTHERS Universal Joints**

Here's another example of Blood Brothers' engineering cooperation . . .
to produce ever-better truck components.

When this major axle source wanted an improved front-driving unit
for a truck-building customer, their engineers and ours got together.
The result shown above now provides users of famous brand trucks
with *substantially increased capacity* on their front-driving axles.

Greater strength, better performance and lower costs may result for
your products too—through a cooperative effort with Blood Brothers.

Just write or call—we'll arrange to meet at your convenience.

For a quick review of our products, request Bulletin 557.



STANDARD PROPELLER
SHAFT ASSEMBLIES



SINGLE AND DOUBLE JOINTS
FOR POWER TAKE-OFF USE



CLOSE-COUPLED JOINTS
AND ASSEMBLIES

ROCKWELL-STANDARD CORPORATION



Blood Brothers Universal Joints

ALLEGAN, MICHIGAN

**UNIVERSAL JOINTS
AND DRIVE LINE
ASSEMBLIES**

Why world famous equipment-manufacturers use Moline power



GRADALL "Most versatile excavating machine in the world." Built by The Warner & Swasey Co., Cleveland. Equipped with Minneapolis-Moline 403A-4A gasoline (or D-425A-6A Diesel).



SPREAD-MASTER Built by Flaherty Mfg. Co., Inc., Pocatello, Idaho. Minneapolis-Moline complete power train is located at right of driver in center of SPREAD-MASTER . . . permits on-the-go loading to provide seamless sealing mile after mile.



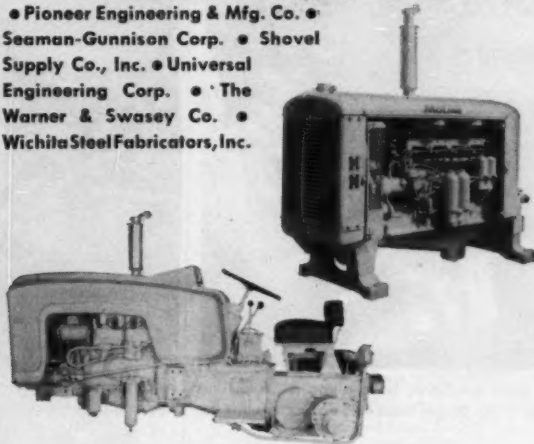
FERGUSON COMPACTOR Manufactured by Shovel Supply Co., Inc., Dallas. Pneumatic-tired model SP-12 is powered by a Minneapolis-Moline power "package".

Famous names in construction equipment manufacturing use Moline power units and Moline torque converter power "packages" in their equipment. Reason: the brute stamina of Moline's high-torque, medium-speed engines is known throughout the world. They're engineered for the longest possible life . . . and they're backed up by a nationwide service organization.

These Moline power units and power "packages" are in daily use on dozens of makes of construction equipment such as shovels, hoists, cranes, in materials handling equipment, road building equipment such as ditchers, graders, crushers, compactors, black-top spreaders.

Partial list of Moline Engine users:

American Hoist & Derrick Co. • American Steel Works • Badger Division, The Warner & Swasey Co. • Barber Greene Co. • Clyde Iron Works, Inc. • Crothers Mfg., Ltd. • Douglas Motors Corp. • Flaherty Mfg. Co., Inc. • Insley Mfg. Corp. • Iowa Mfg. Co. • Lippman Engineering Works, Inc. • Little Giant Crane & Shovel, Inc. • Ottawa Steel Division, L.A. Young Spring & Wire Corp. • Pioneer Engineering & Mfg. Co. • Seaman-Gunnison Corp. • Shovel Supply Co., Inc. • Universal Engineering Corp. • The Warner & Swasey Co. • Wichita Steel Fabricators, Inc.



Our sales engineers will be glad to assist you in designing and adapting the best power for *your* equipment. Write or call Roger R. Hipwell, Manager, Industrial and OEM Sales, Minneapolis-Moline, Hopkins, Minn.

MINNEAPOLIS MOLINE

...makes the NEWS in modern industrial and construction equipment

"We have Standardized on Aeroquip Hose Lines for Quick Replacements That Stand Up in Use"

Edward J. Anderson, Equipment Superintendent of the Construction Company's White Motor Co. Fleet, San Francisco



Aeroquip Hose Lines are used for fuel, oil hydraulic steering and air compressor discharge lines on this Euclid engine.



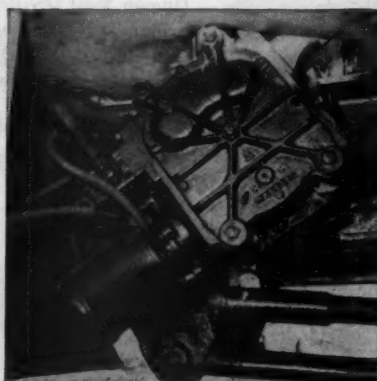
In overhauling 22-ton Euclid TD rear dump trucks at the Belair Maintenance Base, Utah mechanics use Aeroquip Hose Lines with Reusable Fittings for all fuel, lube and hydraulic lines.

"We like the quick replacement feature of Aeroquip Hose Lines," says Superintendent Anderson, "and the fact that they stand up so well particularly in the rough terrain in which we operate."

Cut costly downtime on your equipment. Use Aeroquip Hose and Reusable Fittings for quick-replacement hose lines that stand up under rough use. Call the Aeroquip distributor listed in your Yellow Page Phone Book.



This Utah mechanic is installing a brake line made of Aeroquip Hose and Reusable Fittings.



Another Aeroquip Hose installation is on this hydraulic steering gear unit of a Euclid truck.



Aeroquip 1503 Medium Pressure Hose and 1509 High Pressure Hose is used on hydraulic tank and pump lines.

Aeroquip

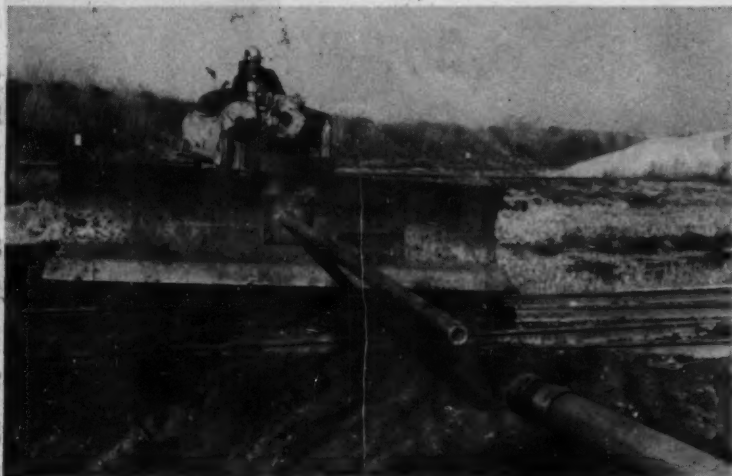
AEROQUIP CORPORATION, JACKSON, MICHIGAN

INDUSTRIAL DIVISION, VAN WERT, OHIO • WESTERN DIVISION, BURBANK, CALIFORNIA

AEROQUIP (CANADA) LTD., TORONTO 19, ONTARIO

LOCAL REPRESENTATIVES IN PRINCIPAL CITIES IN U.S.A. AND ABROAD • AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

Job Talk...



Dozer Pushes Pipe Through Fill

Fitted with a driving guide temporarily welded to its blade, a Caterpillar D6 bulldozer pushed two 4-in. conduits through an 80-ft-wide railroad fill in about three hours on a TVA project.

The scheme proved much cheaper than the usual ditching or jacking methods. A pointed piece of iron screwed onto the end of the first section aided penetration. Lengths of conduit were added, one after another, as the pipe progressed through the fill.

Four studs temporarily welded to the dozer blade held an end plate and a length of pipe that served as a pushing guide. Length of the pipe guide allowed the dozer to back off when stalled and ram the pipe to restart the conduit through the fill.

The Chemical Construction Section of TVA's Wilson Projects Branch devised the method to bring power lines across the railroad to the site of a new slag crushing and screening plant.



How to Keep Pad Bolts Tight

A chemical sealant keeps the pad bolts tight on the tracks of Merritt-Chapman & Scott's crawler-mounted equipment on the mammoth Niagara Generating Plant project at Lewiston, N. Y.

Constant impact with rocks

and frozen ground loosens the pad bolts and the track rail. Previously maintenance crews had to retighten the pad bolts on bulldozer tracks every two or three weeks. This meant taking the

continued on page 28

ALLOY RODS CO.

HARD SURFACING ALLOYS

WEAR-ARC ELECTRODES FOR MANUAL HARD SURFACING APPLICATIONS

- Wear-Arc 3 Iron Powder—Build-up alloy for carbon steel. Machinable.
- Wear-Arc 4 Iron Powder—Non-machinable alloy for carbon steel.
- Wear-Arc 5 Iron Powder—Hard surfacing alloy for resistance to abrasion, impact.
- Wear-Arc 6 Iron Powder—Hard surfacing alloy—abrasion and moderate impact.
- Wear-Arc 12 Iron Powder—Hard surfacing alloy—heavy impact and abrasion.
- Wear-Arc WH—Build-up alloy for carbon and manganese steel parts.
- Wear-Arc Super WH—Hard surfacing alloy—severe impact, abrasion, compression on manganese and carbon steel parts.
- Wear-Arc Nickel-Manganese—for attachment welding or build-up overlays on manganese steel.
- Wear-Arc Chrome-Boride—Hard surfacing alloy for severe abrasion.
- Wear-Arc and Wear-Flame A or B—Hard surfacing alloy—corrosion, heat, abrasive wear.
- Wear-Arc and Wear-Flame 40—Hard surfacing alloy—medium impact, high abrasion.
- Wear-Arc Tungsten Carbide.

WEAR-O-MATIC SEMI-AUTOMATIC HARD SURFACING PROCESS

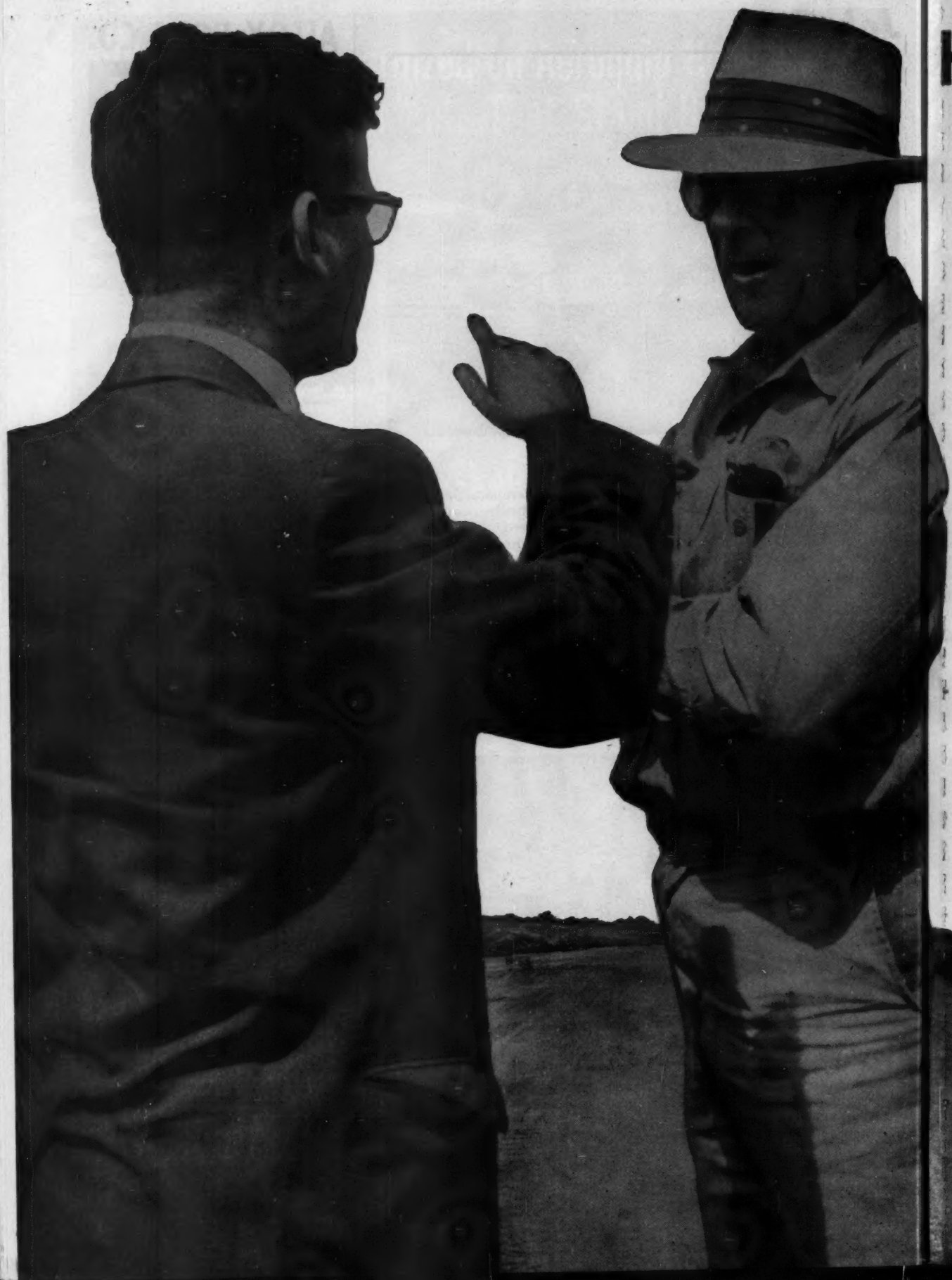


The Wear-O-Matic Wire Feed Unit combined with Wear-O-Matic Hard Surfacing Wires packaged in convenient WELD-PAKS offers superior hard surfacing semi-automatically at a very low initial cost. Faster welding speeds, one man portability, and the superior quality of Wear-O-Matic deposits make the Wear-O-Matic process outstanding for economic longer wearing deposits.

For complete information see your Alloy Rods Company representative or write for Bulletin HS-1.

ALLOY RODS COMPANY

YORK 22, PENNSYLVANIA



HOW Standard Oil serves S.J. Groves on Bong Air Force Base job



P. S. Cauchy, master mechanic (center) and Standard men Jim Sreenan and Fred Schmalfeldt (left and right) settle details on fuel deliveries.

Contractor moves up to 130,000 cubic yards of dirt in day...Standard Oil provides 'round the clock delivery of fuels and lubricants.

Situation: S. J. Groves is building 11,500 ft. runway and taxi strips at Bong Air Force Base, Kansasville, Wisconsin. Men under A. J. McKay, Groves' project manager, are moving 14 million yards of dirt, putting down a million tons of gravel base and pouring 222,000 cubic yards of concrete.

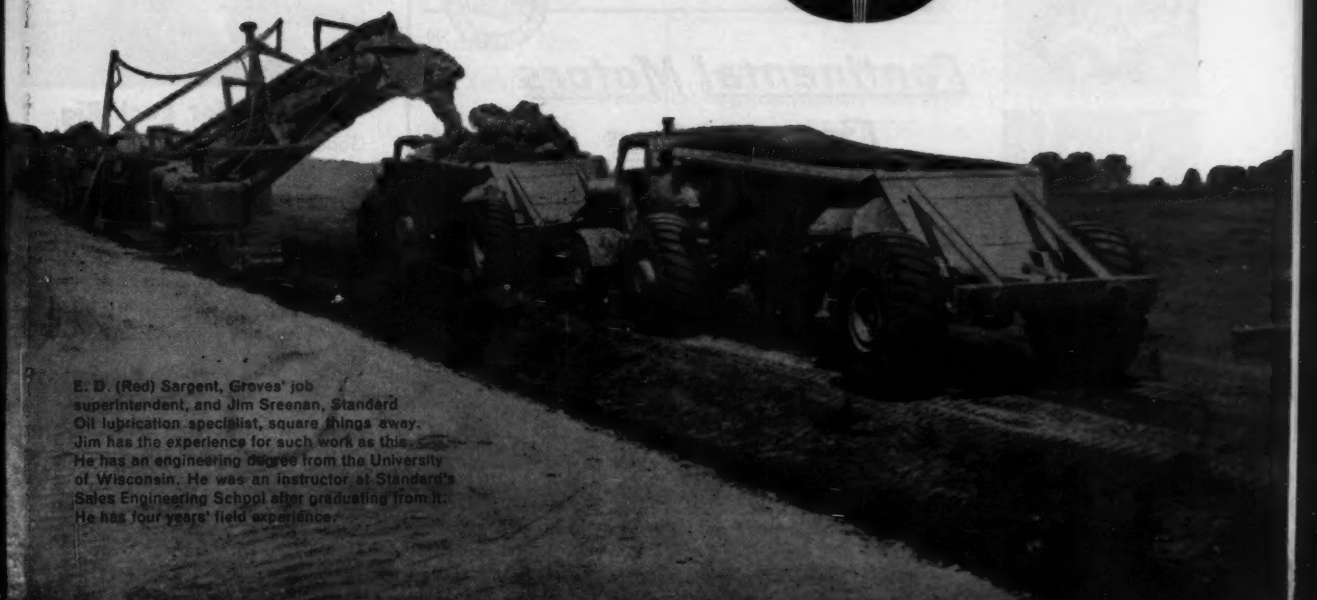
What was done: When Standard Oil received the order from Groves, two lubrication specialists—Jim Sreenan and Mike Harpham—from Standard Oil's Milwaukee offices went into action. They surveyed the fuel and lubrication needs of the 140 pieces of equipment on the job. They specified the Standard Oil products that would (1) do the job without requiring multiple inventories, (2) reduce the chances of misapplication. Then these men arranged for storage of fuel and lubricants

on the site and set up a delivery program with the Standard Oil agent located at Silver Lake, just six miles from the construction job.

Standard Oil agent, Fred Schmalfeldt, and his crews make deliveries to the job between 5:30 and 7:00 each morning and night. In addition, Groves' Euclid dirt loader is serviced by them at noon and midnight. Plus this, a standby truck is stationed at the base throughout the night.

What you can do: This is Standard Oil service to contractors. To get this kind of service on your job, all you have to do is call your nearby Standard Oil office anywhere in the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 So. Michigan Ave., Chicago 80, Ill.**

You expect more from  and you get it!



E. D. (Red) Sargent, Groves' job superintendent, and Jim Sreenan, Standard Oil lubrication specialist, square things away. Jim has the experience for such work as this. He has an engineering degree from the University of Wisconsin. He was an instructor at Standard's Sales Engineering School after graduating from it. He has four years' field experience.



GOOD RULE TO FOLLOW WHEN BUYING MATERIALS HANDLING EQUIPMENT

Choose a Make Whose
Builder Thinks Enough Of
His Own Good Name to
Equip His Product With
CONTINENTAL
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Visit the Continental Display
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(ATLANTA) GA. • ST. THOMAS, ONTARIO



JOB TALK . . .

continued from page 25

equipment out of service for half a day while two men tightened each of the 344 bolts.

After one application of Loctite sealant the bolts remained tight after 12 weeks of operation, working 132 hours per week.

Loctite is a thin liquid that hardens when in contact with metal to form a tough seal. Catalytic action of the metal surfaces, aided by the absence of air, causes the sealant to harden into a heat and oil resistant bond. The hardened plastic grips threaded fasteners securely so that vibration will not shake them loose, yet workmen can remove the nut with a hand wrench. Manufactured by American Sealants Co., Loctite comes in different grades that provide any desired locking strength.

Application of the sealant is simple. Workmen first soak the bolts in a pail of degreasing solution for a few minutes. After inserting the bolts into the holes in the track, a workman squeezes a drop or two of Loctite onto the threads of the nut from a plastic bottle and then turns the nut onto the bolts.



A Record for Each Rig

Good housekeeping in the job office pays off for Berke-Moore, Inc., of Boston, Mass. They keep track of maintenance and repair on their rigs with an individual record book for each piece of equipment.

The books (school notebooks with ruled pages and brown covers) hang in neat rows on hooks along the walls of the office. Pictures cut from trade magazine advertisements and pasted on the front covers identify the type of rig. Service manuals repose in racks beneath the notebooks.

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HIGH RIVER STAGE 433, **30'** OF WATER PERFECTLY CONTROLLED
WET-DRY SUBGRADE 403. BY A MORETRENCH WELLPOINT SYSTEM

Fruin-Colnon Contracting Co. made record time in excavating this deep substructure for Unit #3, the new 200,000 KW turbine generator and boiler unit of the Meredosia, Illinois, power station for the Central Illinois Public Service Company.

Material was medium to coarse sand, and gravel. During high flood stage of the Illinois River, Moretrench Wellpoints pumped 7500 GPM to keep the subgrade dry.

For Moretrench this is a return engagement. In 1947-48 we predrained the foundations for Units #1 and #2.

For nearly thirty-five years contractors all over the world have relied on MORETRENCH for outstanding pumping performance. Take advantage of our years of experience — and top-notch equipment — to get your job going —

IN THE DRY!

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WESTERN REPRESENTATIVE: Andrews Machinery of Washington, Inc., Seattle 4, Washington

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KOEHRING WORK CAPACITY *on rubber...*

Elevated expressway

crosses an industrial valley in the heart of a large metropolitan city. Here, steel girders for bridge deck are hoisted into position by a Koehring® 305 truck crane. It's working with 60 feet of boom. Any time extra reach is needed, this truck-mounted 305 can raise up to 100 feet of main boom, or handle a max. 130-foot boom-and-jib with low A-frame! Combination pin-pad connected boom permits easy "two-man" boom length changes. Lugs on boom allow folding at any joint for travel clearance. Maximum lifting capacity — 25 tons.



KOEHRING DIVISION OF KOEHRING CO., Milwaukee 16, Wis.

Koehring excavators, cranes also manufactured in ENGLAND • SPAIN • JAPAN

In Canada:
KOEHRING-WATEROUS LTD.
Brantford, Ontario



Handle with care! Here's a delicate operation — lifting newly-cast, pre-stressed concrete beams out of forms, and stacking them for use on bridge construction. Each beam weighs 22 tons — an easy lift for the Koehring 435 truck crane. Based on conservative 85% rating it can safely lift up to 35 tons with 40-foot boom — at 15-foot radius.



New sewer line going in — and 16,378 lineal feet of concrete pipe are being placed along the right-of-way by a 15-ton, self-propelled 205 Cruiser® crane. It's 1-man operated, travels at speeds up to 21.5 mph. Axle-load distribution meets highway regulations in most areas — even when carrying 25-foot folded boom. Overall width is only 8 feet.



De-watering a pit — Koehring 545 truck crane with clamshell digs a central drainage sump from which water is pumped out of deep, open-pit uranium mine. This big, truck-mounted 545 is a heavy-duty work-horse on wheels! Has a top lifting capacity of 45 tons (40-ft. boom at 15-ft. radius) — handles up to 120 feet of main boom, or 150-foot boom-and-jib. Quickly strips for roading. Power-lowered A-frame removes the counterweight.

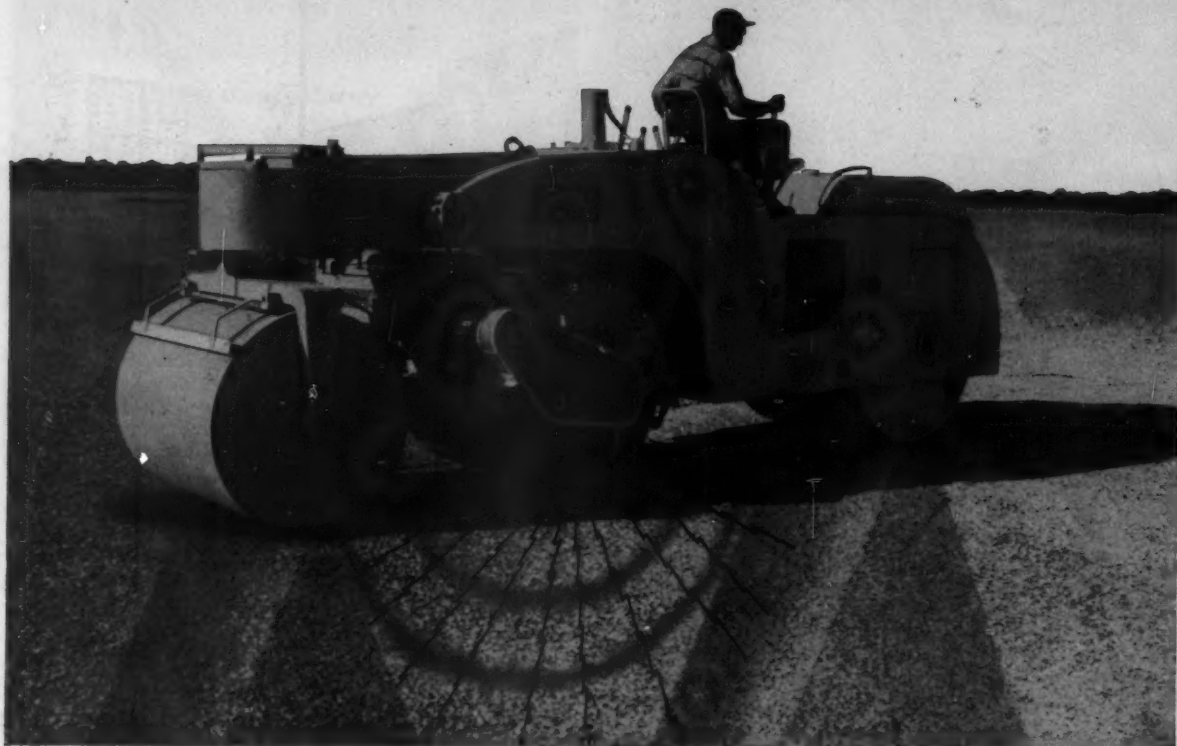
Quick facts on KOEHRING WORK CAPACITY:

MODEL	TYPE OF MOUNTING	CRANE LIFT CAPACITIES (Rubber-tired machines rated at 85% of tipping load.)	
ON RUBBER	205 3-axle truck, or 21.5 mph Cruiser	30,000 lbs.	at 12-ft. radius
	305 3-axle truck, or 18 mph Cruiser	50,000 lbs.	at 12-ft. radius
	330 3-axle truck	60,000 lbs.	at 15-ft. radius
	435 4-axle truck	70,000 lbs.	at 15-ft. radius
	545 4-axle truck	90,000 lbs.	at 15-ft. radius
ON CRAWLERS	Size shovel	CRANE LIFT CAPACITIES (Crawler ratings based on 75% of tipping load.)	
	305 ½ Cu. Yd.	20,000 lbs.	at 10-ft. radius
	305 ¾ Cu. Yd.	30,000 lbs.	at 12-ft. radius
	400 1 Cu. Yd.	40,000 lbs.	at 12-ft. radius
	545 (Crane only — 85% rating)	90,000 lbs.	at 12-ft. radius
	600 1½ Cu. Yd.	71,300 lbs.	at 12-ft. radius
	800 2 Cu. Yd.	104,300 lbs.	at 12-ft. radius
	1205 3 Cu. Yd.	190,000 lbs.	at 12-ft. radius



Extra lift capacity means MORE WORK CAPACITY with all attachments

The inside story on vibratory compaction...



Full surface contact plus max. pressure are maintained at both ends of 15-20 ton roller



1,500 to 2,200 vibrations per minute are concentrated here ...within controlled area



No vibrations escape or dissipate beyond the "loaded" sub-grade soil columns

Center-roll vibration gives greater densities in deeper lifts of materials . . . fewer passes needed

All vibratory effort is exerted in a *downward* direction . . . and *concentrated within a confined ground area*. That's because the vibrating roll is in *center* position on this Buffalo-Springfield® KX-25EV 3-axle tandem. The vibratory action is accompanied by full surface contact at *both ends* of the big 15-20 ton roller. You get vibratory impact . . . plus heavy tandem roller compaction *all in one pass!*

A separate engine, mounted on sub-frame on center roll, transmits power through V-belts to an eccentric axle shaft. The eccentric shaft, running through the center roll, turns at high speeds, creates vibrating action on the roll. Regardless of vibrations per minute, center roll revolves freely to match roller travel speeds.

Over 100% density in 3 passes

At new airbase (above) 6-in. lifts of crushed bank-run gravel, mixed with mineral filler and slag, were compacted to over 100% density in not more than 3 passes. On other jobs, owners report outstanding re-

sults using a *segmented* guide roll, vibratory center roll, and smooth-faced drive roll.

Retains "walking-beam" feature

When vibrating action is not required, the independent power unit is merely turned off . . . and the KX-25EV becomes a standard 3-axle tandem with exclusive "walking-beam" compaction control. *And that's not all!* Hydraulic control raises the center roll, to operate machine as a long-wheelbase 15-20 ton 2-axle tandem. All this versatility in *one* roller can save time and money on your jobs. Let us show you how . . . with a demonstration. Call Buffalo-Springfield distributor or write us.



BUFFALO-SPRINGFIELD ROLLER CO.

SPRINGFIELD, OHIO

DIVISION OF KOEHRING CO.

PNEUMATIC TIRE • VIBRATORY • SEGMENTED ROLLERS • 2 AND 3-AXLE TANDEMS • 3-WHEEL ROLLERS • KOMPACTOR®

**Ask the man who
keeps rigs running!**

*...no one makes
a tougher tooth
than ESCO*



**The construction industry
looks to**



The right design, the right steel, the right
shape make ESCO Points and Adapters
right for every digging condition.

Electric Steel Foundry Co., PORTLAND, OREGON

See reverse for shapes and size range ➤

Here are the points to remember...

**12M
ALLOY STEEL**

ESCO 12M Points are the toughest you can buy. Developed through years of research for the construction industry, cast *ESCO* 12M is carefully heat treated to produce the finest steel made for the severe shock and abrasion encountered by points and adapters.

**RIGID QUALITY
CONTROL TESTS
ASSURE
TOUGHNESS,
HARDNESS**



Every *ESCO* Point is Brinell tested to assure the exact degree of shock-absorbing toughness and abrasion-resisting hardness for longer digging life. Be sure to look for the Brinell mark on every *ESCO* Point you buy.

8 POINT SHAPES

You can select from eight different shapes to find the point that matches your digging conditions. *ESCO* Points are designed by bucket and excavation specialists who know how to achieve top digging performance. The self sharpening design of an *ESCO* Point makes it start sharp and stay sharp.

***ESCO* Points and Adapters
for all digging equipment**

Your local *ESCO* dealer can supply Points and Adapters for all your digging needs. By using *ESCO* Points and Adapters on all your equipment you can cut costs further by reducing your point inventory and consolidating purchases. Call your *ESCO* dealer today for details. He's listed in the yellow pages of your telephone directory. Or, write direct.

LITHO IN U.S.



ESCO Point shapes start sharp, stay sharp and last longer under any digging condition.

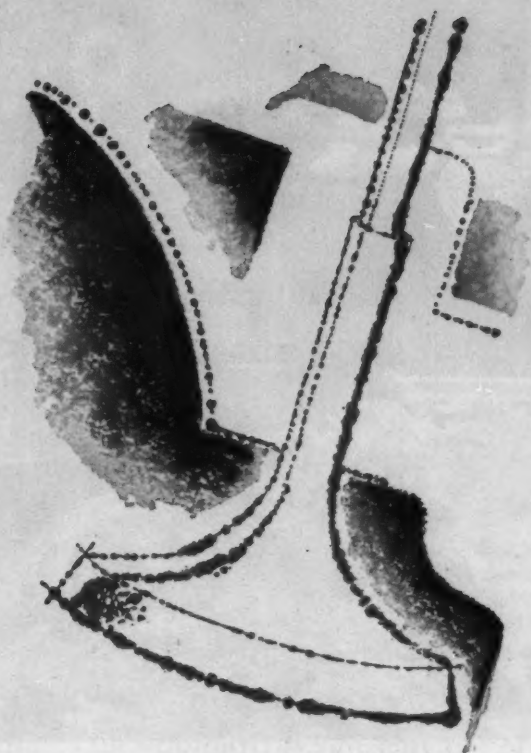


Electric Steel Foundry Company

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Valves... Oil... and How to Save Money

Valves which open and close hundreds of times a minute can cause lost money, time and power when deposits and wear start to take their toll. Sinclair Tenol® Oils fight deposits and wear—help keep vital parts working longer without repair. Refill with Tenol now. Next time management asks how you've cut costs, tell them you've switched to Sinclair—and show them the results.

Call your Sinclair Representative for further information or write for free literature to Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. There's no obligation.



Sinclair

Tenol® Oils



THE TAKE-CHARGE D9

—built big and tough for the big, tough jobs

- 320 HP at flywheel.
- 30-ton weight.
- Exclusive Caterpillar oil clutch — plates cooled and lubricated with oil, rarely need adjustment.
- Optional heavy-duty torque converter transmission.
- Heavy-duty steering clutches with finger-tip steering. Power-boosted controls.
- Extra-rugged frame and final drive.
- Massive 7-roller track frame.

These are just the bare facts. No words and pictures can begin to describe the Caterpillar D9 Tractor. Engineered and built to take charge of any job, it's big, tough — and economical in the long run. See what it'll do on *your* job. Have your Caterpillar Dealer put it through its paces. That's all it asks.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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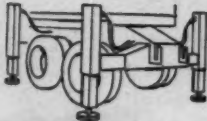
FIND YOUR CATERPILLAR DEALER IN THE




**KING OF
THE CRAWLERS**

This is a HYDROCRANE!



It will lift 24,000 pounds. Its outriggers  operate hydraulically and individually — within seconds to keep you level when you work. The controls are hydraulic — oil-smooth. The boom on a Hydrocrane is telescoping.



You can add 12 feet to your reach *on the move*, without stopping! The standard boom can be 24 to 36 feet long, the high lift boom can be 38 to 50 feet long — or even 70 feet long with the jib! The Hydrocrane travels over streets, highways, in plant yards  as easily and fast as your pickup trucks. Does it work? It works so well that over 50% of the

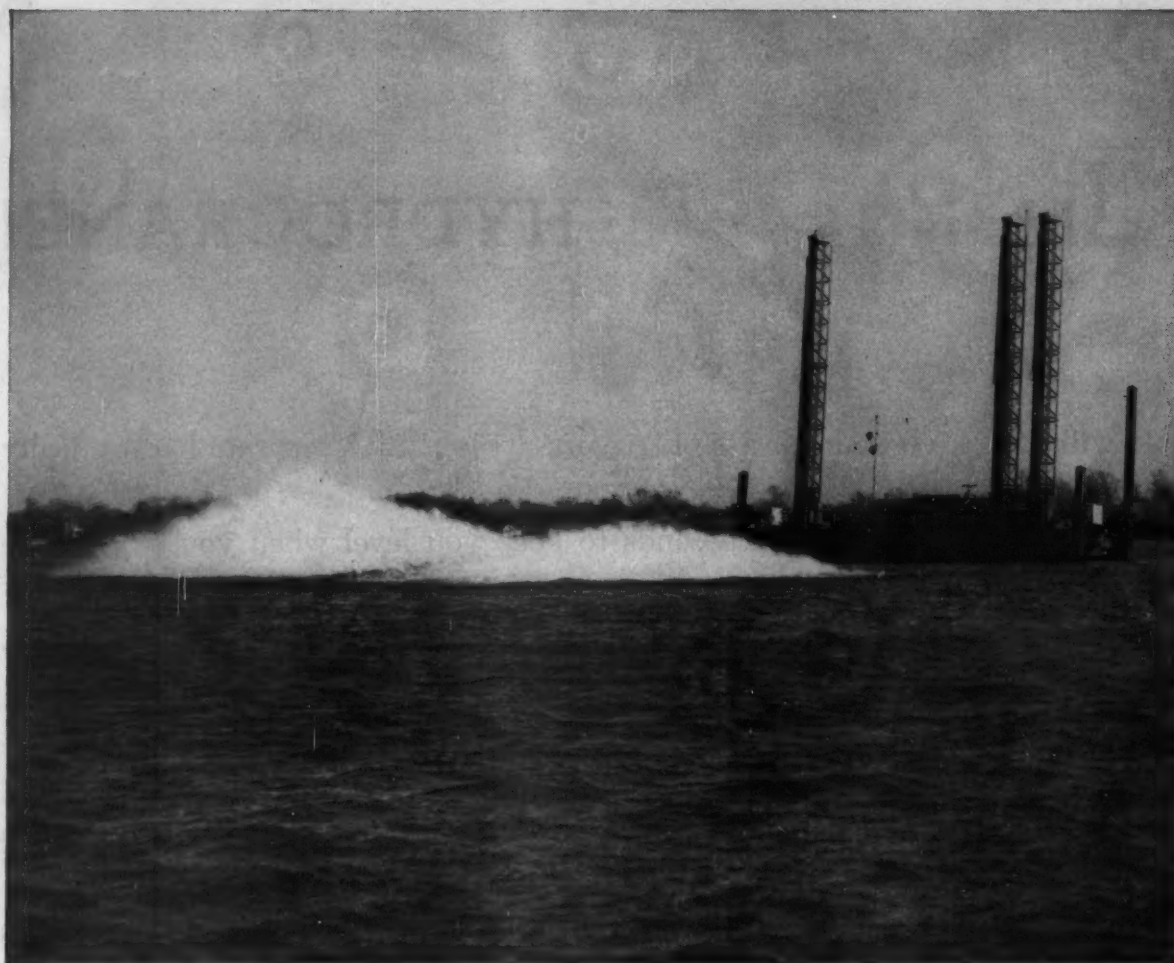


customers* who have ever bought a Hydrocrane, have bought another!

*Who are they? They're steel erectors, contractors and loggers. They're municipalities, utility companies, precast concrete people. And, there are many more every day. See your Hydrocrane distributor for a free demonstration, or write Dept. 15HA, Bucyrus-Erie Company, South Milwaukee, Wisconsin.

**BUCYRUS
ERIE**

Bullds Better Equipment



HERCULES PACKS A PUNCH

Blasting rock at six fathoms to deepen a river channel requires dynamite with a punch and resistance to water pressure. Hercules® High-Pressure Gelatin has been endorsed by contractors everywhere for use where the going is tough.

For nearly half a century, Hercules has pioneered in the development of quality blasting materials, including special explosives for special conditions. Included is a group of explosives that have a high rate of detonation under the pres-

ures encountered in submarine blasting.

Extensive research refinements, and up-to-the-minute knowledge of field conditions have enabled Hercules to produce the right explosives for your individual problem. No matter how tough or rugged the job, Hercules explosives will do the job efficiently and economically.

Hercules technical representatives are available to help you choose the most effective and the most economical explosive for your next job.



Explosives Department
HERCULES POWDER COMPANY
INCORPORATED
 Wilmington 99, Delaware

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XR-59-7

GALION **ROLL-O-MATIC** ROLLERS

*** EXTRAneered for**

EXTRA Performance
EXTRA Long Life
EXTRA Profits
EXTRA Easy Handling

* Extraneering is the implanting in Galion Rollers—through superior design, materials and workmanship—the ability to do better work, operate more economically, and last longer than other rollers.



**Use the GALION
ROLLER RENTAL
PLAN.....**

All Types — All Sizes — All New Models.

Money-saving rates—compare them. Rent for any period of time to suit your specific needs. See your GALION Distributor today.

THE GALION IRON WORKS & MFG. CO.
General and Export Offices—Galion, Ohio, U. S. A.

GALION
ESTABLISHED 1907



MOTOR GRADERS & ROLLERS



New 45 hp In
low-c

Leads the small crawler field in
POWER • SPEEDS • STEERING • EQUIPMENT

Job-proved, high-torque, valve-in-head engine develops 45 maximum flywheel horsepower . . . 31 drawbar horsepower. Job-proved fuel economy.

5 speeds forward, one reverse, with regular transmission.

5 speeds reverse . . . 5 speeds forward with Fast Reverser for faster cycles on shuttle-type work. Go 22½ per cent faster in reverse than in corresponding forward gear. Or . . .

10 speeds forward with exclusive IH Torque Amplifier drive. Boost pull- or-push-power on-the-go in any gear without shifting.

Planetary steering allows for feathered or pivot turns with minimum physical effort. Simple, rugged design simplifies maintenance.

Exclusive, advanced hydraulics deliver 12 or 17 gpm from constant-running, *internal-mounted* pump. Controls heavy duty loaders and a wide range of hydraulically-controlled front-mounted, rear-mounted, or trailing equipment.

Husky track frames, shoes, links, rollers, pins, and bushings assure long track life.

New IH hydraulic bull-grades—angled, tilted, lifted, and lowered hydraulically from the tractor seat



New International Drott T-340 Four-In-One Skid-Shovel—combines in one machine a bulldozer, clamshell, carry-type scraper and ¾ cu yd bucket (⅞ cu yd heaped), all hydraulically controlled

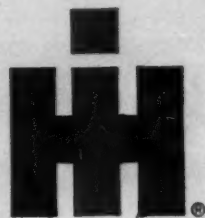
New International Wagner backhoe and loader—can be mounted separately or in combination. Self-leveling loader has 3,500 lb capacity.

International T-340...

Low-cost utility power with crawler traction

Here's power and performance entirely new to the utility crawler field! It's the new International T-340 with power, speeds, job range, and handling ease entirely new to small crawler operation. You now can profit from crawler pull-power and flotation... with proven IH stamina and dependability... scaled in cost to the multitude of jobs where you can't afford to tie up bigger, more costly equipment. With such job-matching options as Torque Amplifier, Fast Reverser, and big-capacity internal hydraulic system, coupled with new planetary-type steering, the new T-340 offers production-boosting features not even available in many larger crawlers!

Try it... test it! Phone your nearby IH Dealer for a T-340 demonstration! For specification folder, write International Harvester Co., Dept. CME-7, P. O. Box 7333, Chicago 80, Illinois.



See your
**INTERNATIONAL
HARVESTER** Dealer

International Harvester Company products pay for themselves in use—
Farm Tractors and Equipment... Trains... Industrial Tractors... Motor
Trucks... Construction Equipment—General Office, Chicago 1, Illinois





CONVEYOR BELTS



View of plant



"U. S." Belt conveying limestone rock



Console board from which the entire 10" to 36" belts of

Lehigh Portland's Union Bridge plant Highly Conveyorized

This immense plant in Maryland has a capacity of 3-million barrels per year. To feed its huge, ever-hungry machinery, the crushed limestone, sandstone and shale are carried on an automatic conveying system, with rubber belting made by "U. S."

The entire system is so trouble-free that one operator (plus an oiler-helper) controls a series of 10 of the "U.S." Belts from console board at the quarry.

The main belt in the system is a 5-ply CX U.S. Matchless;® 3560' long on 1780' centers, 36" wide.

It carries 600 tons of raw limestone per hour, extends from the quarry to a transfer belt which runs to the storage building.

Coal and gypsum are brought nearly 500 feet to storage

by one of the belts in another conveyor system. Being separate from the conveyor handling limestone, either gypsum or coal can be conveyed to storage at any time.

Massive as this Lehigh plant is, provision for expansion has been designed into the conveyor systems. The superior troughing and stamina of "U. S." Belts enable them to handle greater loads if capacity is increased.

The reliability of "U. S." Belts demonstrated in this plant is one reason why United States Rubber is the world's largest manufacturer of conveyor belts.

When you think of rubber, think of your "U.S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.



Mechanical Goods Division

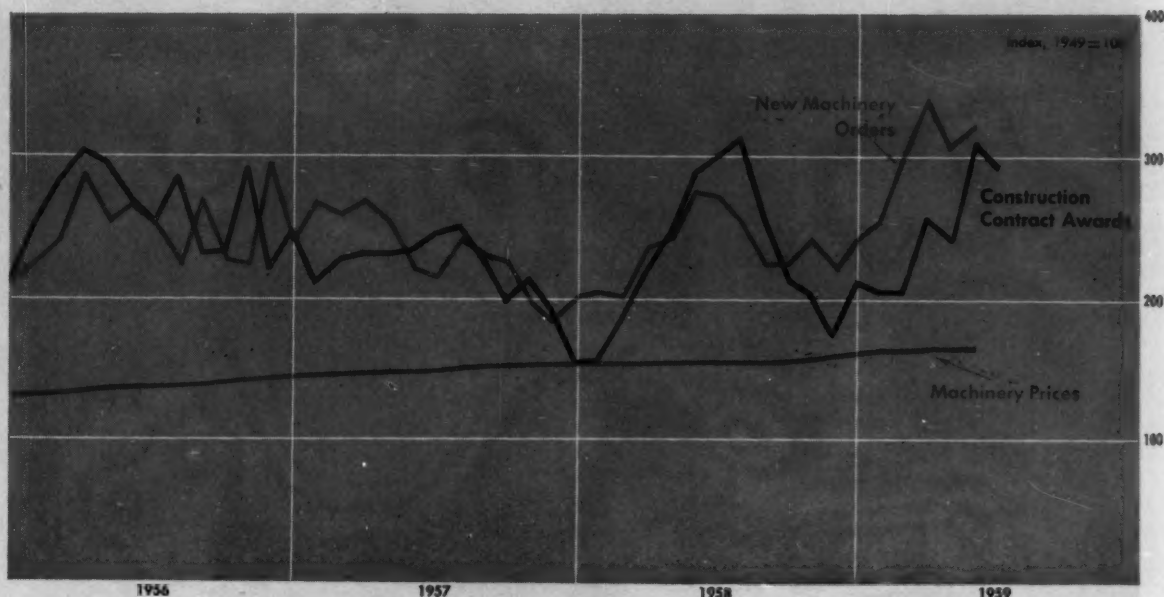
United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y.

In Canada: Dominion Rubber Company, Ltd.

Trends in the Machinery Market



Price Index

	MAY 1959	MONTH AGO	YEAR AGO	% CHANGE 1958-1959
All Types of Equipment	171.9	172.0*	165.5	+ 3.9
Cranes; Draglines, Shovels	168.4	169.2	163.8	+ 2.8
Shovel, ½ cu yd	163.4	163.4	157.8	+ 6.1
Shovel, ¾ cu yd	172.8	172.8	167.7	+ 2.9
Shovel, 1-1½ cu yd	180.5	184.6	178.4	+ 1.1
Shovel, 2-2½ cu yd	162.1	162.1	154.4	+ 5.0
Shovel, 3-3½ cu yd	167.8	167.8	162.7	+ 3.1
Shovel, 6 cu yd	188.2	188.2	180.1	+ 4.5
Crane, truck mounted	165.7	169.6	164.2	+ 0.9
Crane, tractor mounted	135.1	135.1	135.1	0
Bucket, clam shell	157.5	157.5	152.7	+ 3.1
Bucket, dragline	169.3	169.3	160.8	+ 6.4
Scrapers and Graders	165.7	165.7	158.8	+ 4.3
Scraper, 4 Wheel, 8-10.5 cu yd	155.0	155.0	155.0	0
Scraper, 4 Wheel, 12-15 cu yd	156.8	156.8	151.3	+ 3.6
Scraper, 2 Wheel, 15-19.5 cu yd (a)	123.7	123.7	122.7	+ 0.8
Grader, heavy duty	172.6	172.6	164.0	+ 5.2
Grader, light & medium	171.1	171.1	161.2	+ 6.1
Tractors (non-farm, incl industrial)	167.8	167.8	160.5	+ 4.6
Wheel-type, off highway (a)	128.2	128.2	125.4	+ 2.2
Crawler-type, 45-60 dhp	191.9	191.9	182.6	+ 5.1
80-90 dhp	196.4	196.4	185.8	+ 6.2
100-120 dhp	191.3	191.3	186.7	+ 2.5
120 and up dhp	201.3	201.3	191.8	+ 5.0
Machinery, Tractor Mounted	168.6	168.6	161.7	+ 4.3
Dozer, cable controlled	154.5	154.4	151.6	+ 1.9
Dozer, hydraulic controlled	186.6	186.6	177.3	+ 5.2
Cable power control unit	151.4	151.4	147.9	+ 2.4
Loader, shovel type	161.5	161.5*	153.9	+ 4.9
Specialized Machinery	155.1	154.9*	150.3	+ 3.2
Ditcher	156.6	156.6	154.1	+ 1.6
Roller, tandem	209.8	206.1*	193.2	+ 8.6
Roller, 3 wheel	170.2	170.2	161.6	+ 5.3
Ripper and rooter	150.5	150.5	143.3	+ 5.0
Dewatering pump, 10 M gph	110.0	110.0	111.7	- 1.5
Dewatering pump, 90 M gph	149.5	148.6	144.3	+ 3.6
Portable Air Compressors	167.5	167.5*	159.1	+ 5.3
Contractor's Air Tools	161.8	161.8	164.5	+10.4
Mixers, Pavers, Spreaders	155.8	155.8	149.0	+ 4.6
Mixer, portable, 11 cu ft	164.1	164.1	160.1	+ 2.5
Mixer, portable, 16 cu ft	168.9	168.9	163.7	+ 3.2
Mixer, truck, 6 cu yd	131.1	131.1	127.3	+ 3.0
Mixer, paving, 34 cu ft	191.6	191.6	185.2	+ 3.5
Concrete finisher & spreader	191.5	191.5	173.0	+10.7
Bituminous distributor	122.3	122.3	122.4	- 0.1
Bituminous spreader	170.2	170.2	160.3	+ 6.2
Bituminous paver	162.6	162.6	153.0	+ 6.5
Off-Highway Trucks, Wagons (b)	101.1	101.1	100.0	+ 1.1
Contractors off-highway truck (b)	101.1	101.1	100.0	+ 1.1
Trailer dump wagon (b)	101.4	101.4	100.0	+ 1.4

* a January, 1953=100 • b January, 1958=100 • Revised
BLS Primary Market Price Indexes, U.S. Department of Labor, 1947-48=100

Equipment Sales Set New Record

CONTRACTORS are investing at a record pace in new equipment during this most competitive construction boom in history.

New orders of construction and mining equipment during the first five months of this year are the highest on record. The McGraw-Hill Economics Department new orders index rose to 329 in May, based on 1949 volume as 100. This was 5% above the revised index of 314 for April and close to the March record of 339.

May was the eighth consecutive month in which order volume topped the year-ago index. For the first five months of this year, equipment orders are 33% above last year and 16% above the 1951 record.

The rise in equipment orders reflects an even greater increase in heavy construction contracts reported by *Construction Methods*. The Contract Award Index rocketed to 313 in May, based on 1949=100. June construction contracts were nearly as high as May. The Contract Award Index was 299, second highest on record for the month of June.

The booming pace of construction contractors' new business during May and June pushed the second quarter contract award total to \$5,748 million. This was only 0.8% under the record second quarter of last year. And it was just 0.1% under the previous high set in the first quarter of 1956.

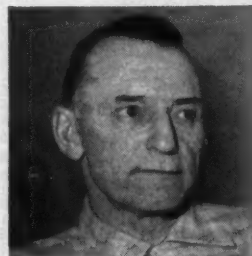
Construction equipment list prices changed little between April 15 and May 15. Downward adjustments in three items offset slight increases in four items. May was the first month this year in which average equipment prices failed to edge upward, as measured by the index of the Bureau of Labor Statistics, Department of Commerce.

Chevy shows plow-horse pulling ability on big construction job



**“Chevy pulled about 37 tons
out of the mud...you can’t
top that!”**

**—CHARLES MATHER, PRESIDENT,
MATHER CONSTRUCTION COMPANY,
JEFFERSONVILLE, INDIANA.**



No job's too tough



"Our Chevy has to have real power since we haul cranes, bulldozers, heavy pipe and other heavy construction equipment on the trailer. One time we had to load a 25-ton crane on the trailer in a new housing area. The mud was so deep that this crane made the trailer sink in the mud down to its axle.

"The Chevy not only pulled the load out, but I discovered I'd left the trailer brakes on! So the truck pulled about 37 tons out of deep mud *even with the trailer brakes on*. You can't top that!

"We have Powermatic transmission on our Chevrolet and that saves us a lot—you don't shift yourself to death. And less wear on the brakes saves us money. It's just like luxury driving with Powermatic. All you have to do is relax and watch the road."

Chevy, you'll find, is winning a lot of new boosters among construction firms, for a number of good reasons. Reasons such as the big 230-h.p. Workmaster

V8 that powers Chevrolet Series 90 and 100 trucks. In tough service the country over, this engine is delivering plenty of proof that it's just about the best yet for big-tonnage hauls. Its high torque (335 ft.-lbs.) gives you plow-horse pulling ability at low speeds and assures the power to keep mammoth loads moving briskly, right on schedule. Its advanced Wedge-Head design and short piston stroke help keep operating costs *low* . . . and its durable features, such as Moraine 400 bearings and Rotocoil exhaust valve rotors, help chop upkeep expense.

This Chevy powerplant is one sure answer to extra savings, and so is the tough chassis that leads to low maintenance with components specially designed for the capacity to out-muscle the roughest kind of runs. For the *latest* in low-cost hauling equipment, see your Chevy dealer! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

for a Chevrolet truck!



How would you load rock this size?

Shoot to size? Cable and lift? Shovel?

There are only two tractor shovels in the business built for work like this . . . the Allis-Chalmers 225-hp, 4-yd HD-21G and the 150-hp, 3-yd HD-16G. They're in a class by themselves. If you move ore, rock,

gravel or overburden . . . if you need a machine that will pioneer, rip, load and handle a multitude of jobs, see them in action. They'll go it alone or team up with other machines to help improve your profit.

Increase bidding power—You're way ahead in bidding flexibility with a big-capacity tractor shovel. Jobs miles away are simple transport operations with Allis-Chalmers BIG tractor shovels. Forget about expensive dismantling, problem loading, hauling and setup again at job site.

Handle scattered jobs economically—Wherever there's loading to do on a new job, these two dependable units "walk" to work . . . through mud—over rough terrain—those spots where *only crawlers* can go! They build their own roads—dozing, cutting, filling, compacting . . . load up to 4 yd at a clip*

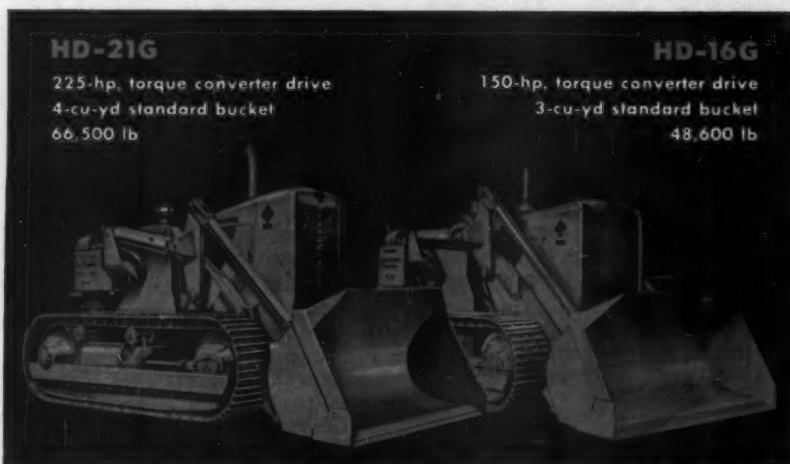
What's more . . . BIG HD-21G's—16G's are not single-purpose units. They're pioneering machines. They'll open up new cuts or make quick work of clearing, piling stumps, brush or boulders. And, of course, loading, stockpiling and cleanup are their steady specialties.

They're ripping specialists—Long track, outstanding balance and power enable HD-21G's—16G's with rear-mounted Tractomotive rippers to open up tough material over *two feet deep*. Enough hydraulic penetrating pressure is developed to lift the tractor itself off the ground.

You can afford to use these big tractor shovels on many utility chores

—from breaking up concrete roadbeds with 72,700-lb break-out force, to complete one-man, one-machine demolition operations. When you apply the abilities of the HD-21G—HD-16G to your own jobs, you'll see how either one or both of these production units can cut costs . . . put a *sharper point* on your favorite bidding pencil.

See your Allis-Chalmers dealer—He's the **ONLY** man with tractor shovels from 72 to 225 hp . . . from 1½ to 7¼ yd. He'll be happy to fill in the details—show you an Allis-Chalmers tractor shovel in action. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wis.



HD-21G

225-hp, torque converter drive
4-cu-yd standard bucket
66,500 lb

HD-16G

150-hp, torque converter drive
3-cu-yd standard bucket
48,600 lb

*Special-purpose buckets available up to 7¼ yd.



Walk to work—This Allis-Chalmers HD-21G makes its own way to rugged, inaccessible working areas . . . can "walk to work" where most units with 4-yd capacity would have to be brought in piecemeal.

... move ahead with **ALLIS-CHALMERS**



Big Allis-Chalmers tractor shovels are built to handle rock this size with ease and durability. Watch one work—or ask the man who owns one about the capacity, versatility, and easy transport they offer . . . three of the most desirable profit characteristics you'll ever find in any one machine!



One-machine fleet—HD-16G handles everything on building removal projects like this. Tearing down the old, loading out scrap, fine-grading in preparation for the new.



No problem loading—Moving from job to job quickly with the HD-21G and HD-16G adds even more value to these two heavy-duty tractor shovels.



.....power for a growing world

What should you get when you buy a dredge?

Important question! But the answer is even more important — because your selection of a dredge should result in an investment, not a gamble. You will want to consider much more than just a price tag and look for essential supplementary values that no builder but Ellicott can give.

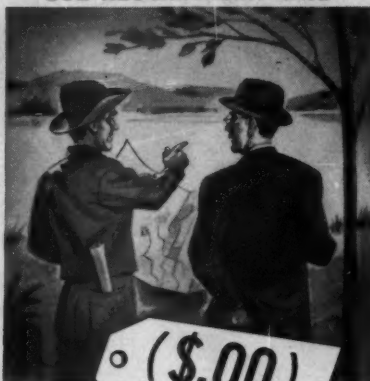
In terms of profitable dredge operations, Ellicott extras will help move water-bound solids at less cost—with greater savings for you.

SOIL ANALYSIS



• (\$\$.00)
(No Extra Cost)

JOB RECOMMENDATIONS



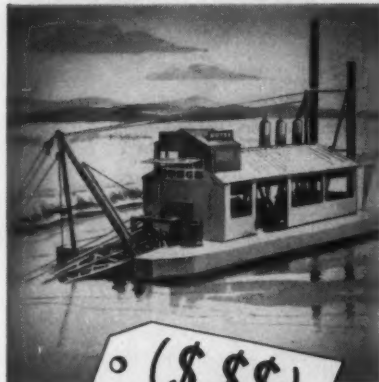
• (\$\$.00)
(No Extra Cost)

**SINGLE ENGINEERING
AND MANUFACTURING
RESPONSIBILITY**



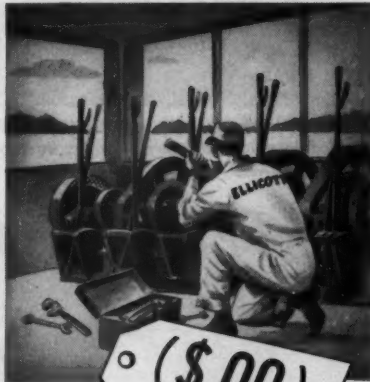
• (\$\$.00)
(No Extra Cost)

QUALITY DREDGE



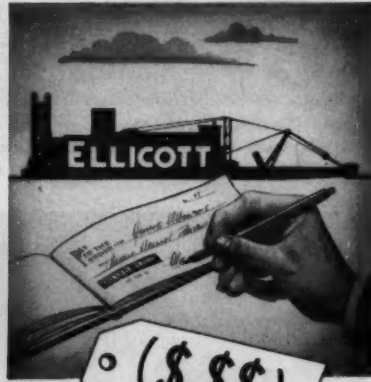
• (\$\$. \$\$)
(Best Value)

FIELD SERVICE



• (\$\$.00)
(No Extra Cost)

BIG RESALE VALUE

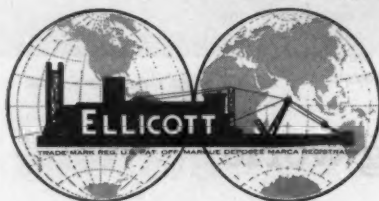


• (\$\$. \$\$)
(Best Return)

Come to Ellicott first for real evaluation of factors you must consider—in your own interest—in selecting the only quality dredge best suited to your needs.

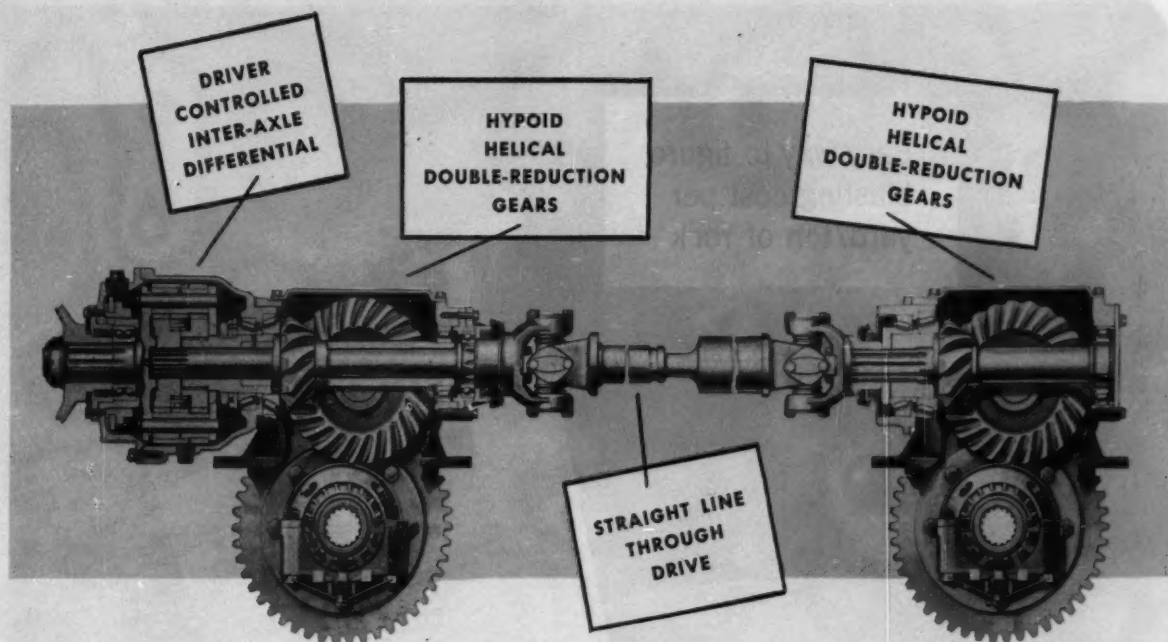
ELLICOTT MACHINE CORPORATION

1605 Bush Street, Baltimore 30, Maryland, U. S. A.



Subsidiaries: Dragues Ellicott France, Paris, France; Ellicott de Mexico, Mexico City, Mex.; Dragas Ellicott do Brasil Ltda., Rio de Janeiro, Brazil; Ellicott Fabricators, Inc., Baltimore, Md.; McConway & Torley Corp., Pittsburgh, Pa.

Successors to the floating dredge business of the Bucyrus-Erie Co. and the American Steel Dredge Co. Complete engineering sales and repair parts service.



Hypoid Double-Reduction Gears Make TIMKEN-DETROIT® HEAVY-DUTY TANDEMS

first in performance, long life and low maintenance cost!

Timken-Detroit Heavy-Duty Tandems with Hypoid Helical Double-Reduction Gears give you payload leadership, long trouble-free service, economical performance. Here's why —

True Double-Reduction. Two full sized gear sets form a balanced power train with each gear set accomplishing a healthy reduction. Husky hypoid first reduction gears and wide faced helical second reduction gears combine to form a rugged double-reduction drive that will out-perform all others.

Widest Choice of Axle Ratios. Timken-Detroit "balanced design" full double-reduction does not limit the secondary gear set to a fixed low numerical value which depends on primary gear set for all ratio changes. The

hypoid-helical gear arrangement permits a wider range of ratios because the numerical value of both the primary and secondary ratio gear sets can be varied.

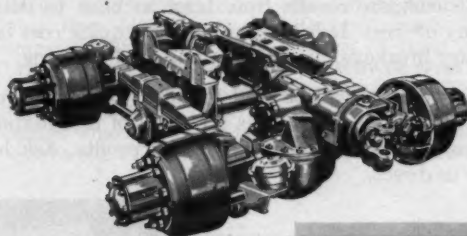
Top-Mounted Straight Line Drive. Eliminates all prop shaft angularity. Bearing and gear life is increased. Maintenance costs reduced. Top-mounted position of carriers provides main drive shaft alignment — ideally suited for short wheel base trucks or tractors.

Driver Controlled Inter-Axle Differential. Divides torque equally between axles, yet compensates for any differential of speed between the axles. Both axles are always doing equal amounts of work . . . can be locked out at any speed when poor traction conditions exist.

Tough, Torsion Flow Axle Shafts Are Best By Any Test. Don't be misled . . . patented Torsion Flow Axle Shafts are still the best available to the American Trucking Industry. Comparison tests prove that Timken-Detroit Axle Shafts, spline diameter for spline diameter, are the toughest ever made.

©1959, R-S Corp.

World's largest manufacturer of axles
for trucks, buses and trailers



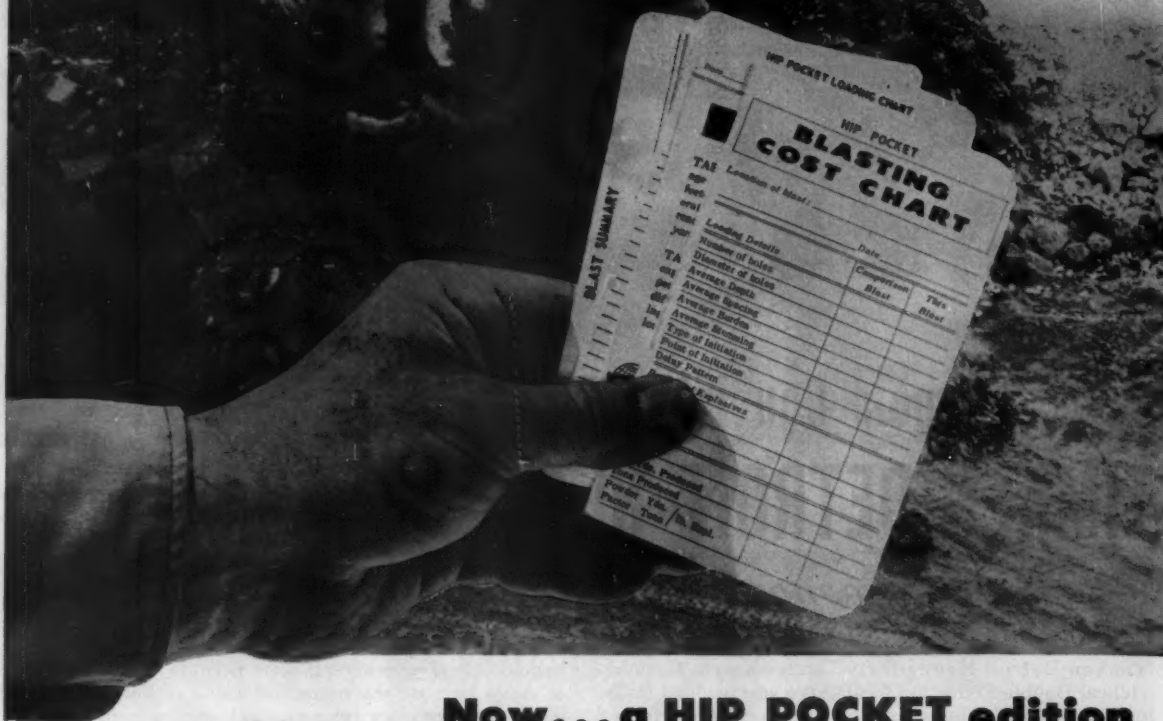
Another Product of...

ROCKWELL-STANDARD
CORPORATION



Transmission and Axle Division, Detroit 32, Michigan

Easy way to figure
blasting cost per
yard/ton of rock



Now...a HIP POCKET edition of the Atlas BLASTING COST CHART

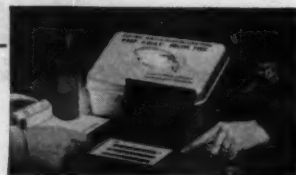
Here's a new 1959 Atlas Blasting Cost Chart that goes right out on the job with you—helps you record the cost data you need to protect your profits.

The original Blasting Cost Chart, with instruction book and Slide Rule, is being used successfully by hundreds of operators. Now, to make it more convenient, Atlas has added this "hip-pocket" edition. With it you can compare results from blast to blast to determine methods that pay off best. It helps you assemble quick cost facts on drilling, secondary breakage, digging, hauling, and crushing.

Your Atlas representative will be glad to show you how to use the new "hip-pocket" Cost Chart. He has a kit full of information that may help reduce your costs and protect your profits. Ask him for details, or write us direct.

**EXPLOSIVES
DIVISION**
ATLAS
POWDER COMPANY
WILMINGTON 99, DELAWARE
Offices in principal cities

Ask your Atlas representative to show you the electric match demonstration... See why Atlas E. B. Caps lead the field in dependable performance.



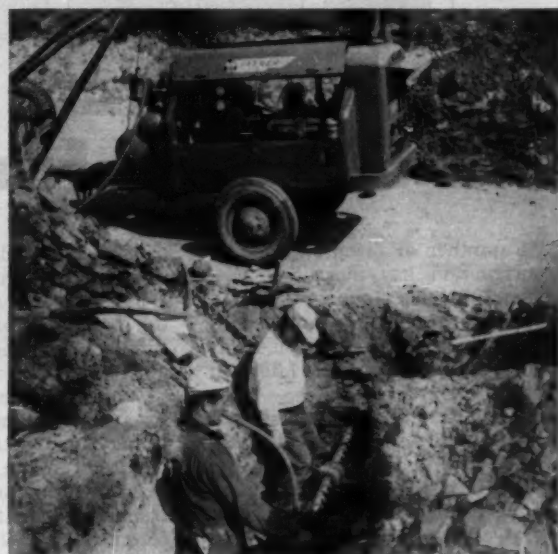


11" PER MINUTE PER DRILL, IN LIMESTONE LEDGE: Constant full pressure produces maximum footage with this Thor self-propelled

"Rocket" rig and BW-2 wagon drill. "Our Jaeger '600' rpm's less, and its 100 psi easily operates the two drills without lag," says owner.



UP TO 140 LICKS A MINUTE with Jaeger "600" behind a McKiernan-Terry 9B-3 four-ton double acting hammer. The operation is setting piles and steel for cofferdams on reinforced concrete bridge project.



ON PIPE TUNNELING WORK, auger deflection caused by fluctuating air pressure formerly necessitated 2 to 3 drillings per hole. With the constant pressure of a Jaeger rotary, one drilling is now enough.

"Our air costs less than ever with a Jaeger"

Owners of Jaeger rotary compressors uniformly note their lower cost of operation compared with other makes. In 8 hours' steady operation a Jaeger "600", for example, averages 48,000 fewer revolutions than any of five other compressors which use the same GM 6-71 diesel engine (1700 rpm full

load speed compared with 1800 rpm). Output exceeds 500 cu. ft. of air per pound of diesel fuel.

SLOWER SPEED MEANS SAVINGS

Jaeger 85, 125, 250 and 365 cfm models are similarly efficient. The fuel savings are substantial. Because all operation is below the continuous

horsepower curve, engine maintenance is at a minimum. In the compressor unit, 8000 hours without replacing a single vane is not at all unusual.

Enjoy this low cost, trouble-free operation on your own work. We will be glad to provide full details and demonstration, or send latest Catalog.

THE JAEGER MACHINE COMPANY

800 Dublin Avenue, Columbus 16, Ohio

PUMPS • SPREADERS • FINISHERS • CONCRETE MIXERS • TRUCK MIXERS

Construction Business . . .

Increase in Construction Firms Since 1951 Leads All Industries



Percentage increase in number of firms between Jan. 1, 1951 and Jan. 1, 1959. Dept. of Commerce.

1 of 5 New Firms Is a Builder

The number of firms engaged in construction has increased 26% since 1951. On January 1, 1959, there were a record number of 475,900 active construction firms compared with only 377,300 on January 1, 1951.

By contrast, the total number of business firms increased only 12.8% in this period. Among the major industries, those in the finance-insurance-real estate category came closest to matching construction with a rise of 23%. However, manufacturing businesses increased only 2.5% and retail enterprises by only 7%, according to estimates by the Office of Business Economics, Department of Commerce.

Construction contractors and subs in operation rose a total of 98,600 during 1951-59 while the number of all businesses increased by 521,900. Thus, one out of every five new firms added to the business population during this period was a construction firm. The numerical increase was greater in retail trade, up an estimated 135,400 firms, but this was a much smaller percentage increase than in construction.

New Entries Up in 1958

The number of new contractors and subcontractors entering the

construction field rose to 60,500 in the year ending January 1, 1959. This was 6% more than in the previous year, but less than the highs of almost 69,000 in 1955 and 1956.

While the number of new entries rose, the number of discontinued construction firms dropped to 52,200 in the last year. Moreover, fewer contracting businesses transferred their interests to different fields in 1958 than in 1957.

The increased rate of new entries and the lower rate of withdrawal from the field explain the sharp rise in construction firms

last year. The gain of 8,300, or 2%, is four times greater than the small rise of 2,200, or 0.5%, in the preceding year.

Growth Below Peak Rate

The rate of growth in construction was a little faster than in industry as a whole last year. In fact, last year brought small declines in the number of firms engaged in manufacturing and in mining and quarrying.

However, the increase in contractors and subcontractors was well below the 12,000 to 22,000 annual increases during 1953-57.

continued on page 56

Growth in Number of Business Firms—By Industry

Estimated by Office of Business Economics, Department of Commerce

Industry	Thousands of Firms in Operation January 1				Percent Change		Percent of Total		
	1951	1957	1958	1959*	1951-1959	1958-1959	1951	1958	1959
All Industries	4,067.3	4,470.7	4,534.4	4,589.2	+12.8	+1.2	100.0	100.0	100.0
Retail Trade	1,820.9	1,925.6	1,947.8	1,956.3	+7.4	+0.4	44.8	43.0	42.6
Service	733.0	810.0	830.1	851.9	+16.2	+2.6	18.0	18.3	18.6
Construction	377.3	465.4	467.6	475.9	+26.1	+1.8	9.3	10.3	10.4
Finance, Insurance, Real Estate	326.9	383.0	393.3	403.3	+23.4	+2.5	8.0	8.7	8.8
Manufacturing	322.8	332.3	333.0	331.0	+2.5	-0.6	7.9	7.3	7.2
Wholesale Trade	268.6	303.7	310.9	317.0	+18.0	+2.0	6.6	6.9	6.9
Transport., Communication, Pub. Util.	180.7	208.4	209.5	211.8	+17.2	+1.1	4.5	4.6	4.6
Mining, Quarrying	37.0	42.2	42.3	42.0	+13.5	-0.7	0.9	0.9	0.9

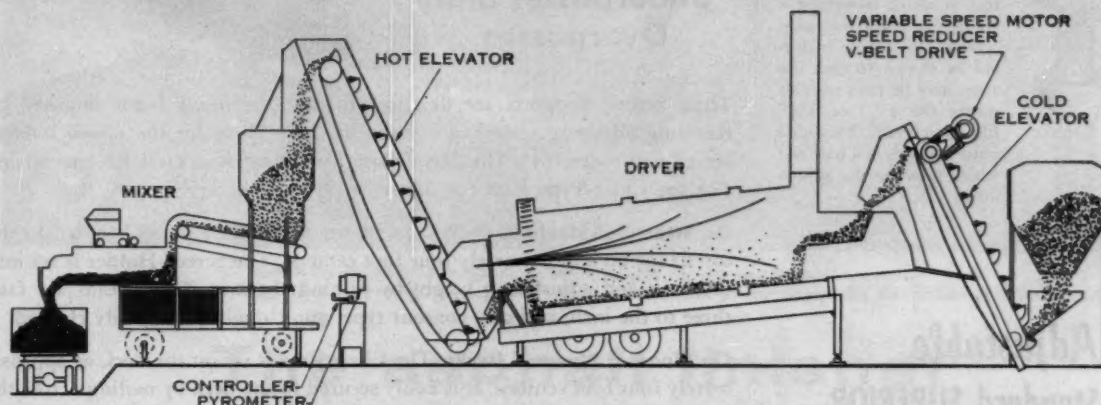
* Preliminary Estimates

engine power

BY CATERPILLAR

ARE YOU OVERLOOKING THE MANY AVENUES OF REPOWERING PROFIT?

Discussions of repowering are usually confined to the replacement of worn-out engines in excavating machines or rock crushers. However, competition in construction today makes it imperative to look at the profitability of every machine in a contractor's spread. To increase profit, replacing engines or changing from utility power to portable electric set power may be required. Converting from gasoline to diesel can also take a machine "out of the red." Frequently changing over from mechanical drives to electric motor drives on some construction machines will enhance performance, production and profit.



For example, in an asphalt plant like the one shown, a power change increased production 15% and increased mobility, too.

Instead of the mechanical drives on product conveyors, the plant uses electric motors powered by the Cat Diesel Electric Set. No longer must the operator constantly check cold elevator feeding, drying temperature and moisture content of stockpiled aggregate.

Now a single switch at the dryer temperature gauge controls the cold elevator to supply exactly the amount of

aggregate the unit's dryer is able to handle properly.

No need to adjust feed gates or dryer flame. Similarly, electrification of a crushing plant can offer sizable improvements in performance and production.

To help you see how your present power stacks up — and to analyze the right power for your equipment, you can receive a "Repowering Handbook Packet" on request. This informative material discusses power replacement in all its aspects and gives you money-saving guides to engine buying. Write to Engine Division, Caterpillar Tractor Co.

CATERPILLAR

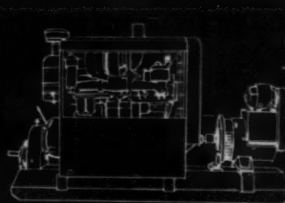
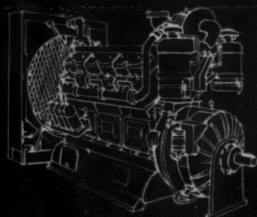
Engine Division, Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Mechanical drives, fluid couplings or torque converters are available on industrial versions of Caterpillar Diesel Engines.

Your electrical power requirements vary widely. Caterpillar offers portable or stationary Diesel Electric Sets from 30 to 350 KW.

New "two-handed" configurations increase engine's versatility—with electric generator at one end and a mechanical drive at the opposite end.



SUPERIOR

Heavy-Duty

SCREED SUPPORTS

Pat. Applied For

For Use with 1 1/4" and 1 1/2" I.D. Pipe Screeds and Vibratory Screeding Equipment



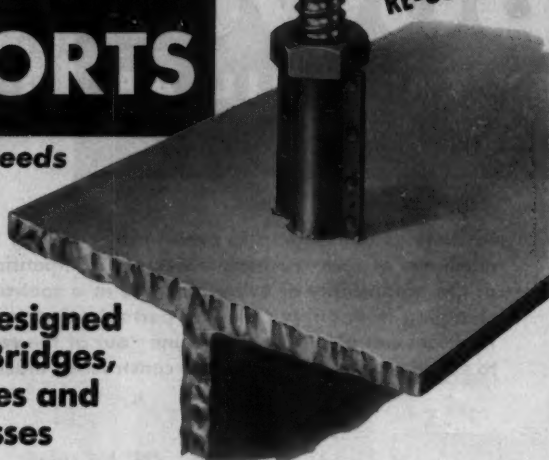
**ADJUSTABLE
RE-USABLE**



ADJUSTABLE SCREED HOLDER

Consists of a 1" threaded rod to which is welded a cradle to hold the pipe screed. This cradle is slotted as shown so that the arms may be bent over to secure the 1 1/4" or 1 1/2" I.D. pipe screed. Threaded onto the rods is a half nut which provides the adjustment.

Especially Designed for Use on Bridges, Underpasses and Overpasses



These Screed Supports are designed to take the heavy loads imposed by traveling vibrating screeding equipment. The Bases for the screed holders are of two types: (1) The Metal Base for use on structural steel members; (2) the Chair-Type Base for use on a plywood deck.

On Structural Steel: As shown above, the Metal Base is tack-welded to the top flange on approximately four foot centers. The Screed Holder is set into the base, and adjusted to height by turning the nut. The threads are fast, three to the inch, and of a contour type, non-clogging and easily cleaned.

On Wood or Plywood Decks: The Chair Base is set on the deck at approximately four foot centers. It is easily secured to the deck by nailing across the upturned legs. If desired, legs can be supplied of galvanized wire. The Chair Base with holder is shown below.

PERFORMANCE

Superior's Heavy-Duty Adjustable Screed Supports have been used on turn-pike structures and other projects. Results in the field indicate that this method of supporting screeds provides a simple answer to an otherwise expensive and complicated set up. *Write for Bulletin.*

Adjustable Standard SUPERIOR SCREED CHAIRS

**FOR FORMED
SLABS
4 1/2" AND
GREATER**

With re-usable
screed holders
using 1" I.D.
pipe and rectan-
gular bars for
screeds.



FOR SLABS ON FILL

With re-usable
screed holders
using 1" I.D.
pipe and rectan-
gular bars for
screeds.



HOLDER INSERTED IN CHAIR BASE

Only the inexpensive bases are left in the concrete. The Adjustable Holders are easily removed, together with the pipe screed, because the holders are set, not screwed into the base. The nut fully covers the base opening and prevents concrete from entering.



SUPERIOR CONCRETE ACCESSORIES, INC.

9301 King Street, Franklin Park, Illinois

New York Office
39-01 Main St.
Flushing 54, N.Y.

Houston Office
4101 San Jacinto
Houston 4, Texas

Pacific Coast Plant
2100 Williams St.
San Leandro, Calif.



Barber-Greene Model 879-B—the universal finisher for any size job—shown paving street for housing development. Write for information on this famous finisher.

The asphalt finisher for all jobs large or small

... Barber-Greene 879-B

With introduction of the Model 873 finisher, which paves on crawlers and travels on rubber—and with the recent Barber-Greene announcement of two new heavy-duty finishers for the ultimate in high-capacity, continuous operation—there have been many questions about selection of the *right* finisher.

Whatever the job, the new, improved Barber-Greene Model 879-B is the universal asphalt paving machine. Unmatched for jobs of all types and sizes, this famous finisher is the paving standard of the world. Its exclusive tamping-leveling principle gives unequaled mat quality while laying any asphalt mix. New improvements include: 25% more power, new transmis-

sion, 60% greater hopper capacity, 45% faster paving speed, faster travel speed, new tamper design, improved screed for longer life, and new crawler design.

FOUR DIFFERENT FINISHERS

Model 873—paves on crawlers . . . travels on rubber. Designed for scattered jobs, from driveways to highways.

Model 879-B—the universal finisher for all types and sizes of jobs.

Models SB-60 and SA-60—pneumatic-tired or crawler-mounted—heavy-duty, high-capacity, high-speed machines.

These are just the high spots. Ask for complete information on all four.

59-11-F

Barber-Greene



AURORA, ILLINOIS, U.S.A.

CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT

BUILT-IN RUST PROTECTION



Blue Brute Air Tools give you a big money-saving feature—they resist rust and corrosion. The reason is an exclusive process: Blu-Coated Parts. With Blu-Coated Parts Worthington Air Tools operate better job after job and in damp atmosphere. They resist wear, seizing, galling. They hold oil better. Even after your toughest jobs you can store them for months without deterioration.

Blu-Coated and Worthington Distributor's Guaranteed Availability Plan keep your jobs going even if your tools are in for checkup or repair. GAP works this way: 1) bring in your Blue Brute tool for repair. While it's in distributor's hands he will, 2) lend you an air tool to keep your job going. See him for complete details, about Blu-Coated, GAP, and assured parts and replacements. 60-15



LOW COST POWER for WRECKING-SMASHING FREDERICK CAST Semi-Steel DROP BALLS

Tough, rugged Frederick Drop Balls eliminate expensive drilling, blasting . . . deliver smashing low cost power when you want it, where you want it. Exclusive "Pear-shape" design drops straight—swings true—withstanding greater impact. Balls 4000 lbs. or over are made of extra durable nickel alloy—or special alloys furnished on request. "E-Z" Swing recessed steel eye gives greater cable protection plus free swinging action. Balls can be furnished with replaceable pins. Use Frederick Cable Weights (135 & 250 lbs.) and Frederick Swivels on all size balls for true, safe cable performance. Special release hooks for free dropping also available.



Wide range of sizes and weights

Pear shape (lbs.).....	1500	2000	3300	4000	5200	6500	8000
Ball shape (lbs.).....	500	1000	2000	5200			
Spherical shape (lbs.)..	470	950	1650	2400	3000	3700	5400

(for magnet use)

Write us today for prices and illustrated literature; order Balls direct or see your nearest Equipment Dealer.

FREDERICK IRON & STEEL, INC.

FREDERICK Established 1890 MARYLAND

Phone: Monument 3-5111

Makers of Manhole Frames, Covers and Steps • Storm Gratings
Meter Frames and Covers • Centrifugal Pumps • Grey Iron Castings



CONSTRUCTION BUSINESS

continued from page 52

This is probably a reflection of two things:

- Contractor capacity has expanded more rapidly than the amount of new work available, even though the total volume of new construction has risen almost steadily during the 1950's. Stiff competition for available work has been too much of a challenge to attract a greater number of new entries.

- Homebuilding dropped in 1956 and didn't recover until the spring of 1958. Because this industry supports a much larger number of contractors and subcontractors than any other type of construction, the declining market tended to discourage many firms from continuing in business while affording less opportunity to prospective new entries.

Biggest Increase

By contrast, the extended highway construction market and the rapid growth in heavy construction other than building—such as waterworks, sewerage, airports, bridges and dams—has contributed to a sharp rise in the number of firms handling these types of work (CM&E, June, p. 43).

SOME BIG CONTRACT AWARDS OF THE MONTH

Morrison-Knudsen Co., Johnson, Drake & Piper, Inc., Paul Hardeman, Inc., & Olson Construction Co. and F. E. Young, 411 West 5th St., Los Angeles, Calif. A joint venture to construct technical facilities at Lowry Air Force Base, Denver, Colo. Corps of Engineers, 1709 Jackson St., Omaha, Neb. \$26,944,820.

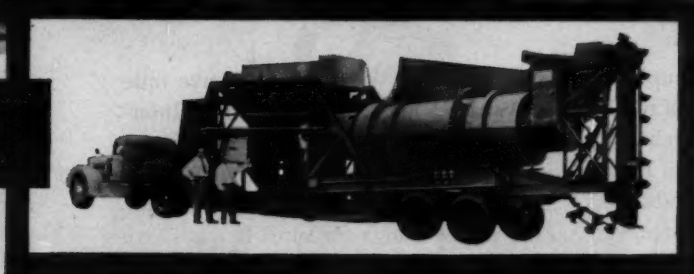
Merritt-Chapman & Scott Corp., 261 Madison Ave., New York, N. Y. Construct Cougar Dam on the McKenzie River near Eugene, Ore. Corps of Engineers, 628 Pittock Block, Portland, Ore. \$23,985,564.

Federal Projects Corp., 1620 W. Thompson St., Philadelphia, Pa. Erect superstructure for Post Office building in Detroit, Mich. U. S. Post Office Dept., 12th and Pennsylvania Aves. N. W., Washington, D. C. \$22,000,000.

ON THE JOB TODAY!



**... tomorrow
on the way!**



STANDARD

T M Mounted ASPHALT PLANTS

For MORE PROFITS on low tonnage hot-mix jobs, see the STANDARD Model T-M Trailer Mounted Asphalt Plant, the biggest batch-type plant on wheels, completely self-contained in its own trailer frame . . . in 2,000, 1,500, and 1,000 pound batch capacities.

Entire plant wheels to the job, can be set up and placed in operation in as little as eight hours. Operators in the field report the Standard Model T-M Trailer Mounted Asphalt Plant produces as much as 60 to 80 tons per hour of hot mix.

STANDARD Model T-M Trailer Mounted Asphalt Plants offer the same rugged design features as the larger STANDARD Model R-M Semi-portable Asphalt Plants, including: Super-Lift Dryer with Saw-Tooth Lifters . . . Heavy Duty Hi-Speed Mixer . . . Simplex Pushbutton Batching Control . . . Positive Control of Liquid Asphalt . . . Complete Accessibility. Field proven for a number of years, the Model T-M is designed for extreme portability and top capacity. Here's the largest, most economical Trailer Mounted Batch Type Asphalt Plant in the world.

PUSH BUTTON ERECTION

Exclusive Standard power-hoist automatically raises the mixing unit from transport to operating position in less than one hour.

STANDARD
ASPHALT PLANTS

... built to do a better job!

The rugged, massive Standard R-M Asphalt Plant packs more power, with extra capacity, over-sized vibrating screens, elevators, and dryers; larger bearings, heavier shafts and giant sized hi-speed pug-mill. This gives you the toughest and most economical asphalt plant in the world. Available in 2,000 to 8,000 pound batch capacities.

STANDARD STEEL CORPORATION

General Office & Plant, 5089 Boyle Avenue, Los Angeles 58, California
Midwest Office & Plant, **LEADER IRON WORKS**, Decatur 89, Illinois
(Division of Standard Steel Corporation)

PARTS WAREHOUSES IN LOS ANGELES AND DECATUR, ILLINOIS

STANDARD
Road-Master
ASPHALT PLANT



ROTARY DRYERS • KILNS • COOLERS • ASPHALT PLANTS

Cities Service makes the grade

**Wins praise of grading contractors,
James Peterson Sons, Inc., and
Kluck Construction Co., Inc.**

Just completed near Menomonie, Wisconsin, is a five mile section of two lane highway to be included in the Federal Interstate Highway program. Some call it the Knapp-Menomonie section of Hudson Eau Claire Road. Others simply call it Interstate Route 103.

But whatever you call it, one thing's for sure: It was tough work! Just on the portion handled by Peterson & Kluck, 700,000 yards of earth had to be moved . . . for this is not an old highway made larger, it's a completely new road cut directly through virgin territory.

With that kind of task, Peterson & Kluck had to squeeze every last ounce of performance out of their machines . . . there was no time to send them back to the shop for servicing. That's where Cities Service played a crucial role. To begin with, Cities Service C-500 Motor Oil, and Trojan H-2 Grease provided the extra protection so vital to equipment working under prolonged heavy loads and dusty conditions.

And Cities Service rounded out this protection with on-the-spot lubrication, checkups, and servicing. Wherever Peterson and Kluck went, Cities Service went . . . and the road went through on schedule.

If you're looking for this unique combination of expert field service plus heavy duty lubricants, call in a Cities Service Lubrication Engineer from the nearest branch office. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, New York.

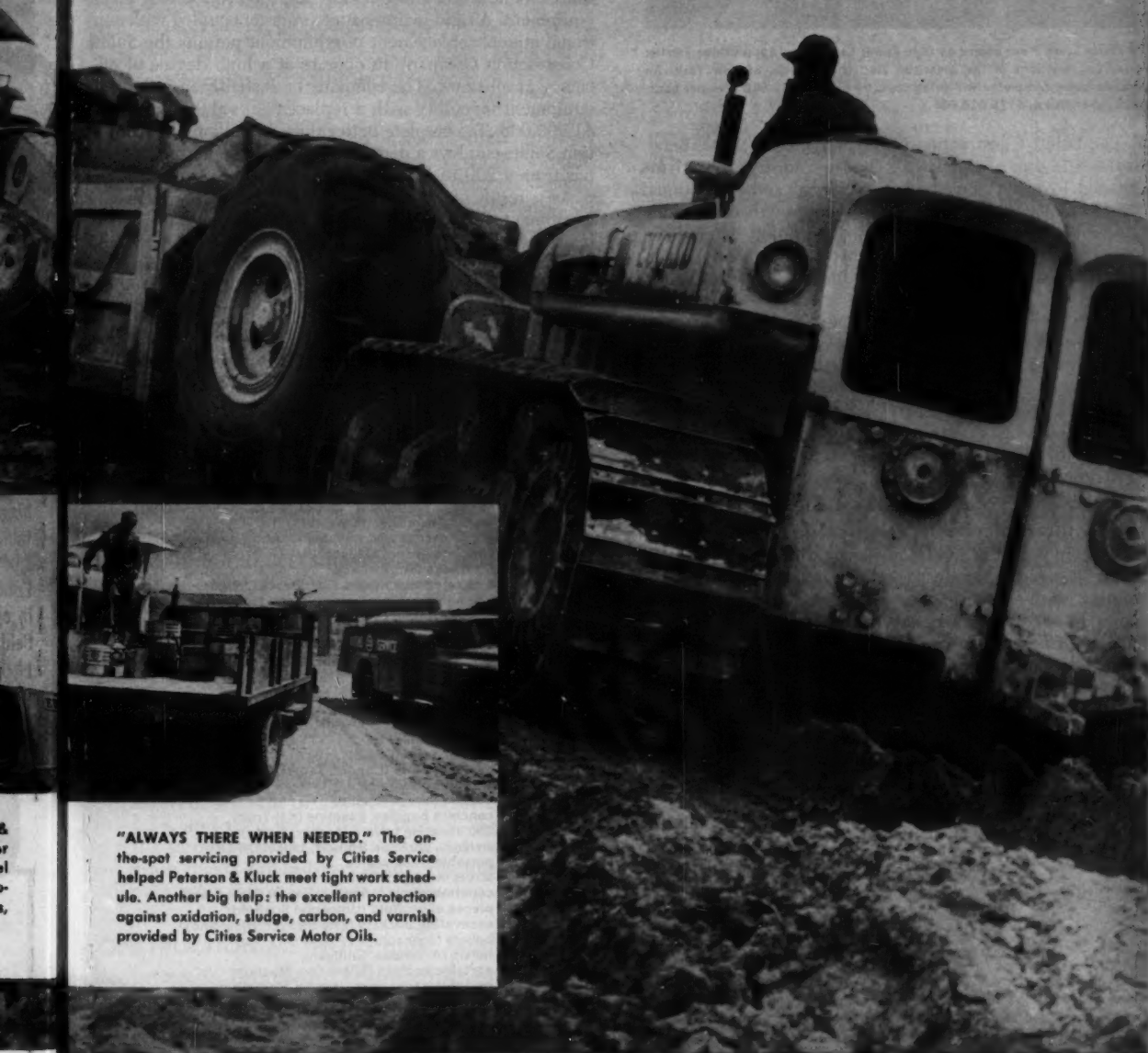
CITIES SERVICE
QUALITY PETROLEUM PRODUCTS



WORKING AGAINST THE CLOCK, Peterson & Kluck depended on Cities Service C-500 Motor Oil to prevent bearing failure. Ideal for diesel engines, Cities Service C-500 gave vital protection against the severe engine temperatures, heavy loads, and start-stop conditions.

James Peterson Sons, Inc., Medford, Wisconsin
Kluck Construction Co., Inc., Stevens Point, Wisconsin

e on Interstate 103



"ALWAYS THERE WHEN NEEDED." The on-the-spot servicing provided by Cities Service helped Peterson & Kluck meet tight work schedule. Another big help: the excellent protection against oxidation, sludge, carbon, and varnish provided by Cities Service Motor Oils.

Sollitt Construction Company completed construction across the nation

...with 530 pieces of equipment and 1700 men



The Philip Sporn Plant owned by Ohio Power Co. and the Appalachian Electric Power Co., Divisions of the American Electric Power Co. of New York. An addition being completed will bring capacity up to 1,050,000 k.w. per hour. Total expenditure, \$175,000,000.

■ The Sollitt Construction Company, Inc. of South Bend, Indiana is one of America's leading contracting firms engaged in heavy industrial, commercial and institutional construction work. This firm is the outgrowth of a family tradition more than a century old. John Sollitt entered the construction business in Chicago in 1838 to begin the unbroken heritage which has come down to the present. In April, 1935, the Sollitt Construction Company, Inc. was organized in South Bend, site of a regional office of its predecessor firm, Ralph Sollitt and Sons of Chicago.

The men who managed the parent firm's regional office remained to direct the organization and continued development of the present firm. Their more than 38 years of experience has encompassed the successful completion of major projects in all categories of construction throughout the United States.

\$8.9 million of construction completed in 1958

In recent years the Sollitt Construction Company has been primarily engaged in industrial, commercial and institutional building, with emphasis on steam generated electric power plants. In twenty years, twenty-nine units with an installed capacity of 5.5 million kw were completed. Like most contractors doing over a million dollars of work a year, Sollitt's projects extend to many different states, often with several projects going in different states at the same time. In 1958, Sollitt's construction activities extended from Indiana, Ohio and Virginia, to West Virginia, Michigan and Illinois.



Shown above are the different types of equipment used in Sollitt's privately owned gravel and concrete plant serving South Bend, Indiana area. Five trucks and truck mixers in foreground, two dual axle tractors that haul cement and in foreground is the concrete plant.

In 1958, this contractor completed \$8.9 million of construction. In the five-year period through 1958, the firm completed \$67,303,886 of construction... an average of \$13.4 million per year.

Owens 530 units of equipment—achieves flexibility and mobility

Because of its diversified work and in many different locations, Sollitt owns and operates some 530 pieces of major equipment. A rigid maintenance program coupled with continual annual replacement of equipment permits the Sollitt Construction Company to operate at a high degree of efficiency at all times. The company consistently maintains an equipment inventory with a replacement value in excess of \$1,500,000. To complete better than \$8 million of construction Sollitt employs a permanent staff of 240 employees and has from 1,200 to 1,500 workmen at peak season.

As a result of this long-time company policy regarding equipment, the firm is capable of servicing major projects in many parts of the nation simultaneously. The company's equipment includes cranes, derricks, bulldozers, tractors, compressors, carryalls, concrete mixing plants, heavy-duty dump trucks and all manner of smaller automotive and auxiliary equipment. All is Sollitt owned and serviced equipment. The following is a breakdown of major equipment:

SOLLITT EQUIPMENT INVENTORY

- 17 air compressors (Joy, Sullivan, Jaeger)
- 3 self-propelled compactors
- 3 portable concrete plants (Erie Strayer)
- 15 crawler cranes (P&H)
- 4 truck cranes (P&H)
- 25 concrete finishing machines (White, Kelley, Master)
- 1 motor patrol (Austin-Western)
- 1 gravel dredge and washing plant
- 21 concrete mixers (Jaeger, CMC)
- 2 tilt trucks (Smith)
- 5 concrete truck mixers (Ford truck, Jaeger mixers)
- 4 pile hammers (McKiernan-Terry, Vulcan)
- 11 crawler tractors (International)
- 38 concrete vibrators (White, Master, Viber, Syntrol)
- 6 rubber-tired loaders front end (Lull, Trojan)
- 39 dump trucks (Studebaker, Chevrolet, Ford)
- 5 truck tractors (Ford, Mack)
- 3 to-bed trailers (Nelson, LaCrosse)
- 2 cement tanker trailers (Gramm)
- 27 pumps (Jaeger, Homelite, Ingersoll-Rand)
- 1 roller (Galion)
- 10 lumber saws (CH&E)
- 10 masonry saws (Clipper, Target)
- 2 scrapers (Heil)
- 3 bottom dumps (Euclid)
- 6 concrete buggies, gasoline (Kal-Truk)
- 4 200' hoisting towers (Archer, Insley)
- 38 welders, portable (Hobart, Lincoln, P&H)
- 2 portable truck scales
- 2 street sweepers (Wilshire)
- 1500 concrete panel forms (Universal Form Clamp)
- 5000 pieces of scaffold (Universal Scaffold)
- 34 excavating buckets (Erie Strayer, Blaw-Knox)
- 10 boilers (Johnson)
- 20 hoists (American, Sullivan)
- 41 portable heaters (Silent-Glo, Master)
- 7 portable generators (Master, Homelite)
- 51 pneumatic hammers (Joy)
- 9 concrete drills (Joy)
- 10 tampers

\$67 million of in five years

Sollitt Equipment Policy major factor in its success

An example of the Company's strength in major equipment is the wholly owned and operated gravel pit and concrete mixing plant located in South Bend - Michawaka area. This installation is supplemented by several movable concrete plants transferred to major project sites and operated by Sollitt for the duration of the project. Strategically located near the industrial and population centers of the nation, the Sollitt offices and their full resources are in close touch with even the most distant projects by company-owned airplane.

Sollitt averages \$2 million per year for materials

A considerable investment in materials used in heavy construction is made by Sollitt each year. In 1957 for example it spent \$2.3 million for materials including steel, cement, lumber, etc. and \$1.9 million in 1958. In a two-year period through 1958, Sollitt poured approximately 166,000 cubic yards of concrete.

The Management and Buying Policies of Sollitt

Each of the officers of the Sollitt Construction Company actively directs the operation of some phase of the firm's activities in conjunction with experienced project managers and other key personnel who are part of the permanent organization. Two hundred of the firm's employees have completed 10,000 hours or more of work with the company. These factors add up to the company's success and growth formula.

It's no wonder that purchasing operations in this contracting firm are most important.

Ralph B. Sollitt, Treasurer, says:

"Our superintendents and other supervisory personnel have the authority to order certain construction products directly, up to a certain amount. On major equipment items, the recommendations and opinions of the men in the field are brought into the vice president in charge of construction. The men using the equipment are consulted. At meetings of the officers and top management, all equipment needs and recommendations are carefully discussed and considered. We talk things over with the men on the jobs, and then we arrive at our buying decisions. It's important that we evaluate and consider the many direct and indirect influences among our key men who enter into our purchasing activities."

**CONSTRUCTION METHODS gives quality
circulation in important contracting firms!**

The value of CONSTRUCTION METHODS to leading contracting firms throughout the nation is evidenced by the 51 key men in Sollitt Construction Company who subscribe to



MR. LINCOLN A. SOLLITT, *President* (at left) and MR. RALPH S. SOLLITT, *Chairman of the Board* (right). Both are long-time readers of CONSTRUCTION METHODS MAGAZINE.

Lincoln A. Sollitt, president, says:

"There are several reasons why a construction contractor should read a variety of trade magazines. CONSTRUCTION METHODS belongs on the 'must' list because of its excellent coverage of equipment news in ads and stories, and because of its valuable, practical 'how to do it' articles. That is why 51 of our key men have subscriptions to CONSTRUCTION METHODS."



Officers of Sollitt who play an important role in the firm's direction and management. From left to right—Mr. Ralph B. Sollitt, Treasurer and Asst. to the President; Mr. George A. Sutherland, Vice President in charge of construction; Mr. Richard I. Gagnon, Secretary.

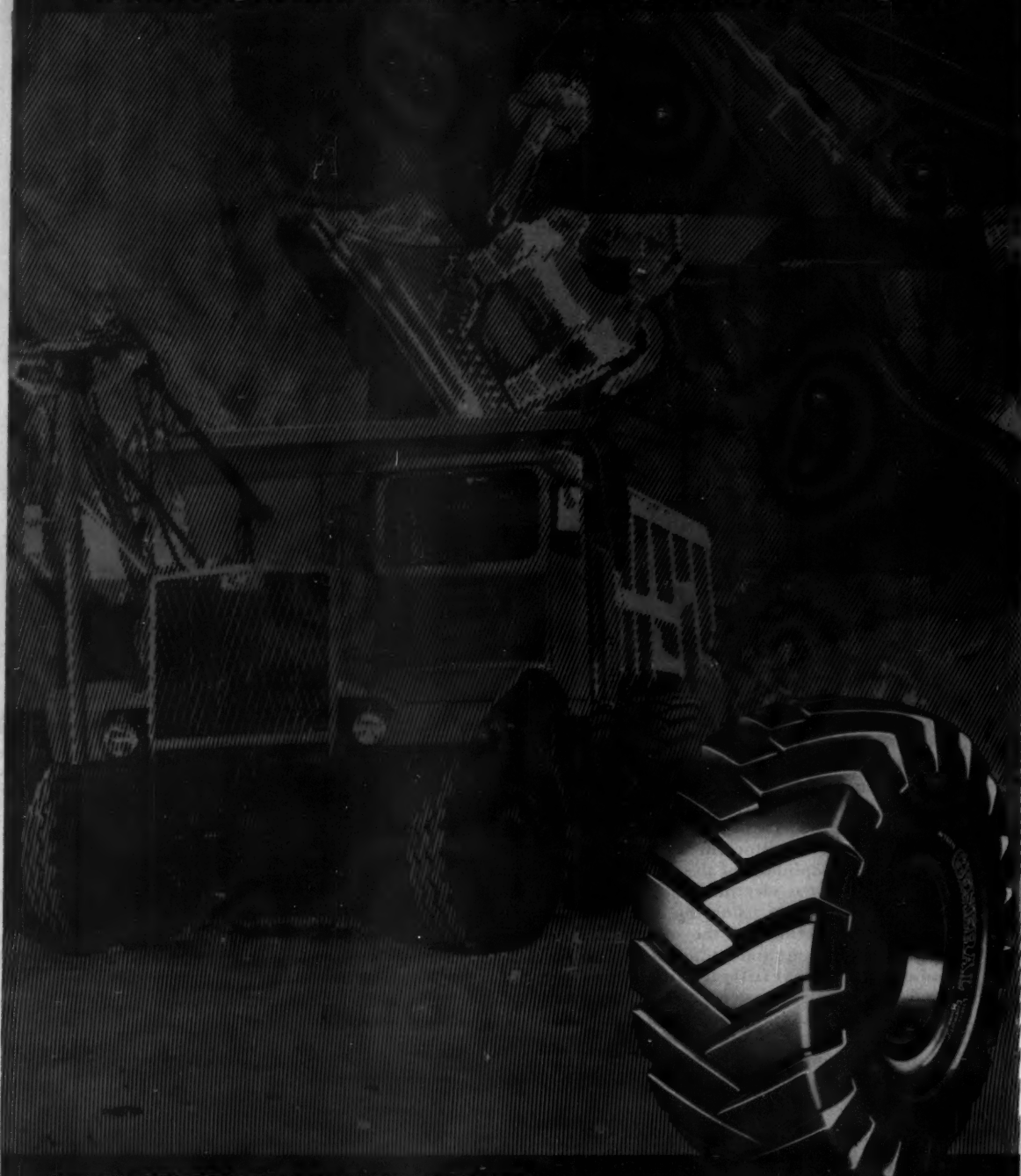
it. These are the men in construction with responsibility who play an important role in the purchase and use of equipment and materials used in construction. These are the men who represent CONSTRUCTION METHODS *quality* circulation in America's important contracting firms. You can reach and penetrate these firms with consistent advertising in CONSTRUCTION METHODS AND EQUIPMENT . . . the contractor magazine.

**Construction
Methods** AND
EQUIPMENT

A MCGRAW HILL PUBLICATION
330 WEST 42nd ST., NEW YORK 36, N.Y.



GENERAL TRUCK TIRES are quality-built with exclusive NYGEN® Cord to provide the maximum in original and recap mileage . . . to keep rolling on the toughest jobs and thus make contracts pay off for the most important man in your organization . . . you!



Specify GENERALS on your new equipment

THE GENERAL TIRE & RUBBER COMPANY, AKRON, OHIO

**PICTURE
OF THE
MONTH**



Building on Top of a Building

• Florida contractor Fred Howland, Inc., has to move all materials for construction of a five-story hotel up an elevator and across a bridge to the site. That's because the hotel is being built right on top of the two-story terminal building at Miami International Airport. Howland's \$1.9-million contract contains a provision prohibiting the

movement of materials through the busy terminal from the site and across a bridge spanning the building. So all materials go up an elevator 120 ft roadway to the front entrance of the terminal. A second elevator at the rooftop site rises 105 ft above the terminal building. It will handle material for the upper floors of the hotel.

\$ 1,000,000 RECONSTRUCTION JOB

Saves New York City Vehicular and Transit System Bridge



River Water Seepage Problem Solved With Marlow Pumps®

The Roosevelt Avenue Bridge, over the Flushing River in Flushing, New York, carries trains of the city's transit system, as well as heavy highway traffic. Recently, it was noticed that the structure was sinking, endangering both highway and train travel. To correct this, a contract was issued by the Department of Public Works of the City of New York to the Woodcrest Construction Company for the reconstruction of the West approach to the bridge.

When the two-decked structure was originally built, it used wood piles sunk 70 feet below grade. As the ground on

the site is mostly filled with fly-ash from incinerators, new steel piles were driven to between 100 and 120 feet below grade to properly support the new bridge abutments.

Seepage from the nearby river became a very serious problem when digging excavations for the abutments. In addition, the abrasive nature of the fly-ash fill could cause trouble to the pumps. To solve *both* problems, Ed Good, General Superintendent for Woodcrest, set up a 6E4 Marlow Contractors Pump. Running six hours a day, this 90,000 GPH, self-primer, sold by Foundation Equipment Co., completely controlled

the onrushing water. The 360° cleaning action of the Marlow kept the casing clean and, because there were no close clearances in the pump to wear, the abrasive liquid caused no trouble in the units. Ed Good had used Marlows for some time and *knew* they would perform without trouble.

Marlows can help solve your construction pumping problems. There's a unit from Marlow's complete line of self-priming and diaphragm pumps that's just right for your job. Write today for the name of your Marlow dealer and a copy of Marlow Contractor Pumps Bulletin C-09.



MARLOW PUMPS®

DIVISION OF BELL & GOSSETT CO.

Midland Park, New Jersey

Morton Grove, Illinois • Longview, Texas



NEW DW21 SERIES G "LOADS FAST AND HAULS FASTER"

Supt. Ruben Hawkins, Harbaugh & Wright, Inc., Enid, Okla.

More production, faster cycles, more profit—that's the report on the new Caterpillar DW21 Series G Tractor with new No. 470 LOWBOWL Scraper.

As Ruben Hawkins (see above) sums it up from his experience on a 2½-mile Interstate Highway job in Oklahoma:

"This new DW21 has plenty of power. It loads fast and hauls faster."

The contracting firm of Harbaugh & Wright, Inc., brought in four new DW21s to move 1,263,218 yd. of dirt on this project. On the first 10-hour day, they handled 484 loads of 19 cu. yd. on an 1,100-ft. haul. And they kept up this blistering pace to finish the job 40 days ahead of schedule!

For the down-to-earth facts on this great new heavy-duty wheel rig, see the box below. Note that the new

DW21 Series G gives you important increases in horsepower, rimpull and scraper rating. Standard tires have also been increased to 29.5-29 (28-ply rating) to handle the increased scraper capacity.

Your Caterpillar Dealer has the complete story on the important new DW21 Series G—and he'll prove what he says with a demonstration on your job.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**NEW DW21
SETS NEW STANDARDS
OF EARTHMOVING**

Cat DW21 Series G Tractor with No. 470 Scraper is pushloaded by Cat D9 Tractor on Interstate Highway job in Oklahoma.

NEW DW21-NO. 470

Series G Series B

NEW HP	—345 (maximum output)—increased 8%
NEW RIMPULL	—49,100 lb. (maximum)—increased 12%
NEW SPEEDS	—increased rimpull provides up to 20% faster travel speeds under similar haul road conditions
NEW CAPACITY	—19.5 cu. yd. (struck)—increased 8%
	27 cu. yd. (heaped)—increased 8%

Corresponding increases have been made in the new four-wheel DW20.



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28 miles of Asphalt for this Texas State Highway

PHOTOGRAPHS

(Left) Power graders were used to spread leveling course of TEXACO Asphaltic Concrete over old pavement.

(Right) Mechanical paver lays second course of TEXACO Asphaltic Concrete. Note small roller attached to paver, which bevels edge of pavement.

CONTRACTOR
GULF BITULITHIC COMPANY,
HOUSTON

This Texas project illustrates an important advantage of Asphalt highways — the ease and economy with which Asphalt paving can be strengthened to serve increased traffic.

To the existing Asphalt pavement on this 28-mile section of State Highway 87, Texas recently added a new, two-course surface of hot-mix Texaco Asphaltic Concrete. A strong, lasting bond forms between the new and old Asphalt courses, providing a pavement which readily copes with today's heavier traffic load.

The aggregate used in the new plant-mixed Texaco Asphalt surface on Route 87 consisted of uncrushed gravel, shell screenings and sharp field sand.

Helpful information on all of the heavy-duty, intermediate and low-cost types of Texaco Asphalt paving for streets, highways, airports and parking areas is supplied in two free brochures. Our nearest office will be glad to mail you copies. No obligation.

TEXACO INC., Asphalt Sales Div., 135 E. 42nd Street, New York City 17
Boston 16 • Chicago 4 • Denver 1 • Houston 1 • Jacksonville 1 • Minneapolis 3 • Philadelphia 2 • Richmond 11



TEXACO ASPHALT

WORK-ABILITY



EUCLID TC-12

...WAY AHEAD OF ANY OTHER CRAWLER!

5 BASIC ADVANTAGES
of this Twin-Power Tractor give you a Better Return on Investment...

TC-12

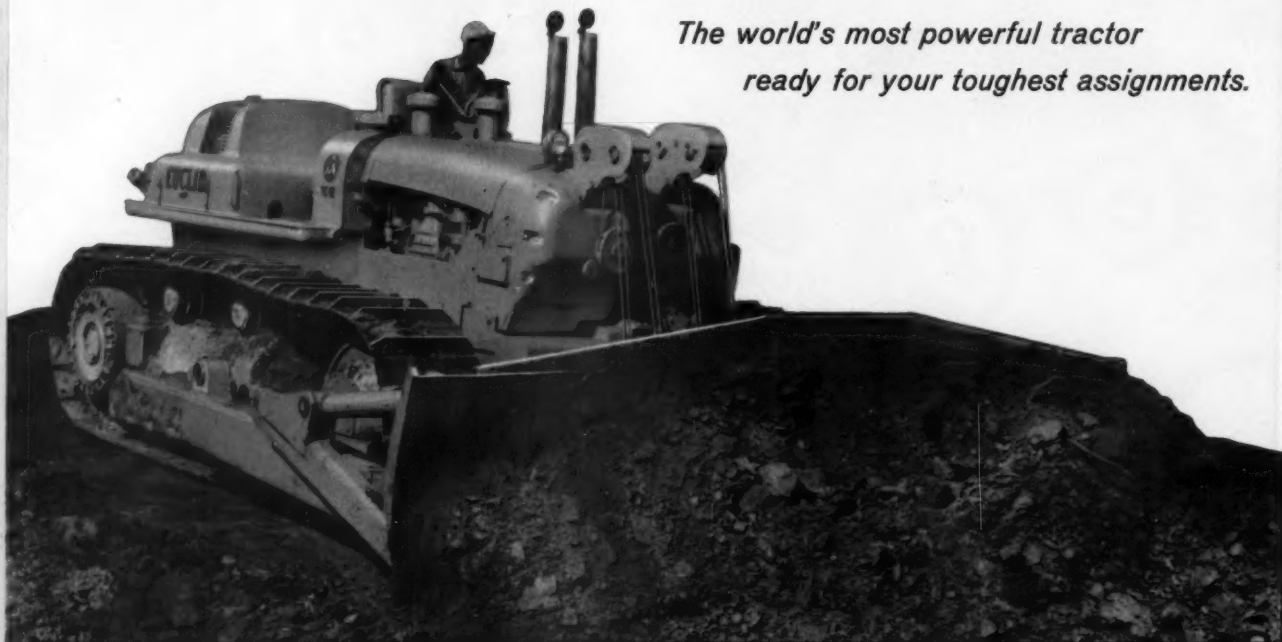
TWIN POWER

425 NET H.P.

Unequalled Power...Performance...

A completely new concept in tractor design and performance when it was introduced 5 years ago, the TC-12 continues to lead the field in workability. Its functional, years-ahead design, 425 net h.p. and two Torqmatic Drives make it the best all-around performer in the big tractor field . . . for push-loading scrapers, dozing, heavy ripping and pulling big equipment. Big power, easy operation, good visibility and fast-on-its-feet maneuverability enable the TC-12 to get more work done every shift . . . and bring a better return on investment.

*The world's most powerful tractor
ready for your toughest assignments.*



Reliability proved by thousands of operating hours on all types of jobs!



Maneuverability...Ease of Operation and Maintenance

5 BASIC ADVANTAGES OF THE TC-12

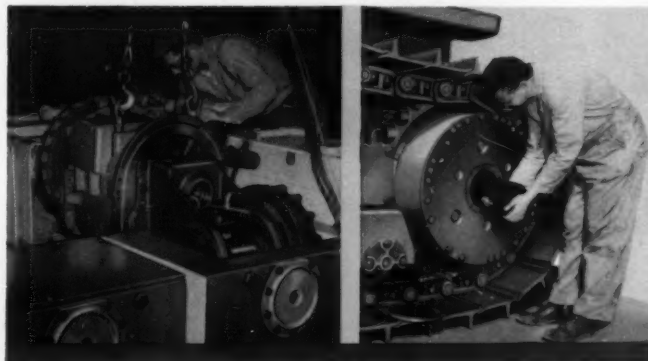
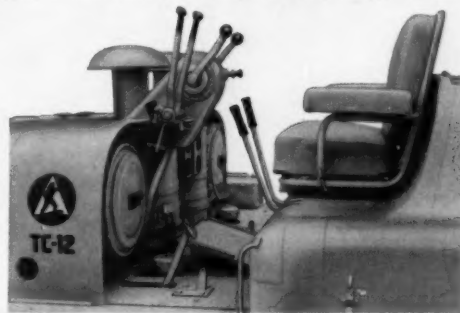
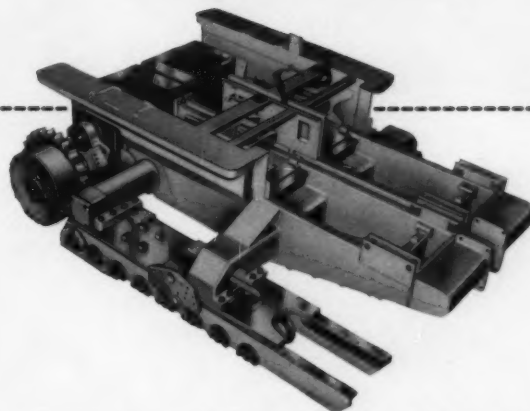
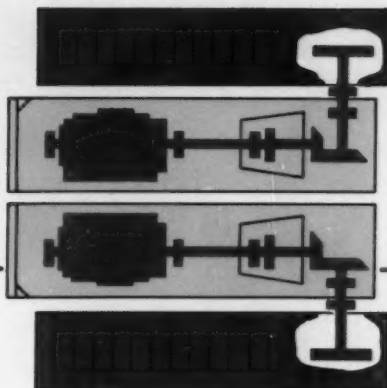
TWIN ENGINES . . . Total of 425 net h.p. With two performance proved engines the TC-12 has up to 35% more net h.p. and 46% more work capacity than the biggest tractors of other makes. Separate Torqmatic Drives for each engine automatically match power to work requirements for push-loading scrapers and heavy dozing.

INDEPENDENT TRACK DRIVES Separate power trains provide individual control of speed, power and direction of each track. Spin turns can be made in its own length by simply reversing the direction of one track. Since only half of the total h.p. of the TC-12 can ever be applied to each track, there's no shock load in turning . . . less wear and tear on sprockets, tracks, rollers and other driving parts.

RIGID TRACK ALIGNMENT Each track is rigidly positioned to its main frame and is kept in constant alignment . . . a large diameter pivot shaft connects the two frames and permits free oscillation of each half for maximum traction on rough ground. Heavy track frames, just above ground level, add to stability and transfer shock loads to the rugged main frames. Longer track life, and resulting reduction of downtime and maintenance costs, are important advantages of constant correct track alignment.

FAST, EASY OPERATIONS Full power shifting . . . independent track drive with separate power trains . . . ability to spin turn in its own length . . . good visibility . . . convenient simplified controls . . . elimination of all clutching . . . ample operator space for comfort . . . excellent over-all balance . . . all of these factors contribute to easy operation that improves operating efficiency and gets more work done every shift.

UNEQUALLED ACCESSIBILITY Advanced engineering and unitized assembly of components reduce downtime for maintenance and repair. "Package" assembly and out-in-the-open accessibility saves many hours in the removal, servicing and replacement of engines, sprockets, converter-transmissions, final drives and other components. For example, drive sprockets can be replaced in about one-half the time required for a competitive crawler . . . final drives four times as fast . . . transmission-converter and brake package in one-fourth the time.

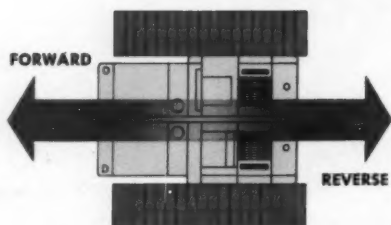


EUCLID **TC-12**

BIG POWER PERFORMANCE PRODUCTION

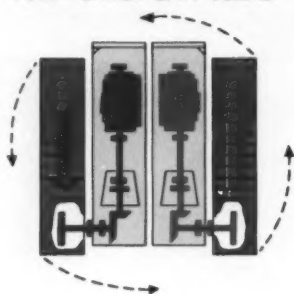
to beat the pinch on profits

TWIN POWER
425 NET H.P.



NO CLUTCHING . . . NO STOPPING

FULL POWER SPIN TURNS



Speeds up work cycles... higher job availability

Whatever the application . . . heavy dozing, ripping, push-loading scrapers, etc. . . the power, speed and mobility of the TC-12 get more work done faster. With full power shift, from any speed range to another and from forward to reverse and back again, there's no clutching. Independent power trains for each track permit spin turns and variable power application for slide slope and other work. Functional design provides excellent accessibility and easy operation . . . cuts downtime for servicing and repairs far below that required for any other big tractor. Prove to yourself that the Euclid TC-12 gives a better return on investment.

Get all the facts now!



EUCLID

DIVISION OF GENERAL MOTORS
Cleveland 17, Ohio

EUCLID (GREAT BRITAIN) LTD.
Lanarkshire, Scotland

... a complete line of equipment for heavy earthmoving, mining, logging and many industrial operations ...

Only Gardner-Denver offers 6 crawler drills for your choice

Swing Boom "Air Trac"® (Model ATD3000)—drills more holes from one position . . . reaches out to $2\frac{1}{2}'$ on both sides of track for a total reach from side to side of $11'10"$ with boom at 45° elevation . . . drills horizontal holes to $9'6"$ above ground level. Like all "Air Trac" models, it is self-equalizing, self-stabilizing . . . moves safely, easily over rough terrain.

"Air Trac" (Model AT)—the first crawler drill . . . the carrier that made the wagon drill obsolete . . . still the only rig designed to level itself when riding over rough, rocky ground.

Model AT50—"Air Trac" with hydraulic drill positioner and hydraulic remote controls.

Model AT1000—with longer tracks and heavy-duty traction air motors for greater stability in severe terrain.

Model AT1500—like AT1000, has longer tracks and greater traction power. Designed for complete power positioning with hydraulic drill positioner and hydraulic remote controls.

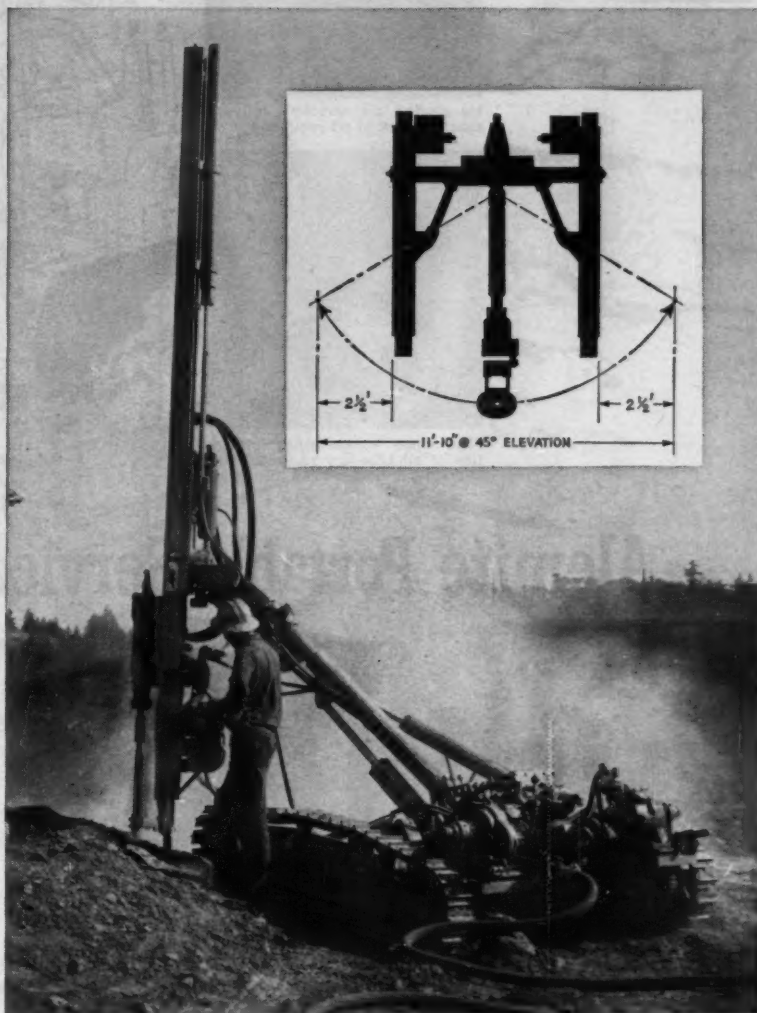
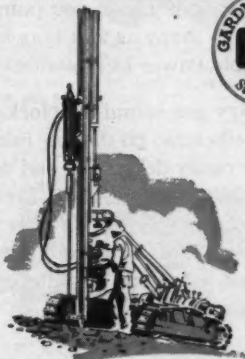
Model HT-143—biggest and most powerful crawler drill available . . . carries the hard-hitting Gardner-Denver $5\frac{1}{2}"$ drill.

SETTING THE PACE

The trend to crawler drills in recent years was pioneered by forward-looking engineers and construction specialists who developed the Gardner-Denver "Air Trac," another example of Gardner-Denver's 100-year philosophy of growth—there's no substitute for men.



100
1959
YEARS



Plus . . . the most complete line of field-proved drifter drills available . . . and quality, longer lasting Gardner-Denver sectional drill rods, couplings, and ring seal shanks.

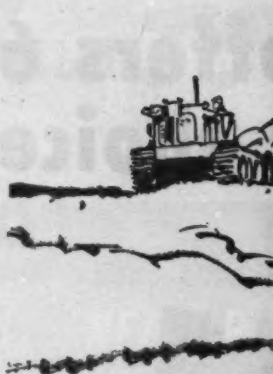
Write for bulletin.

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

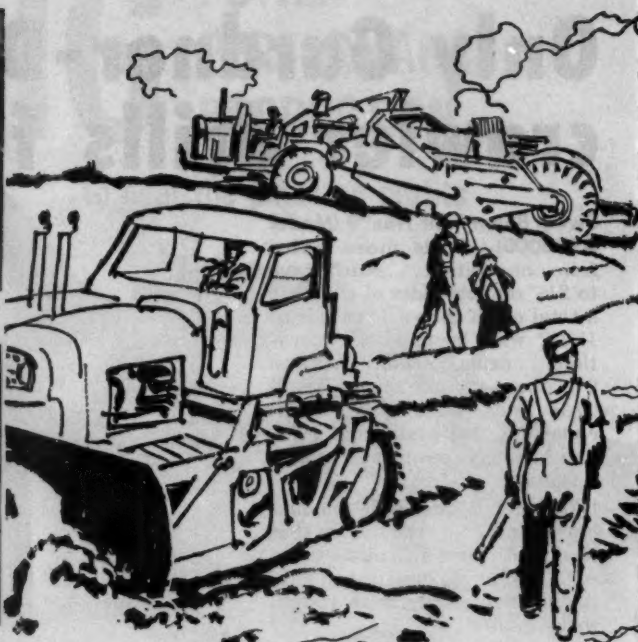
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario



No engine oil wasted — delivers exact amount of oil required!



Fast, easy, high-pressure lubrication of all bearings equipped with hydraulic or button-head fittings!



Alemite Portable Service Stations Help Rigs Meet



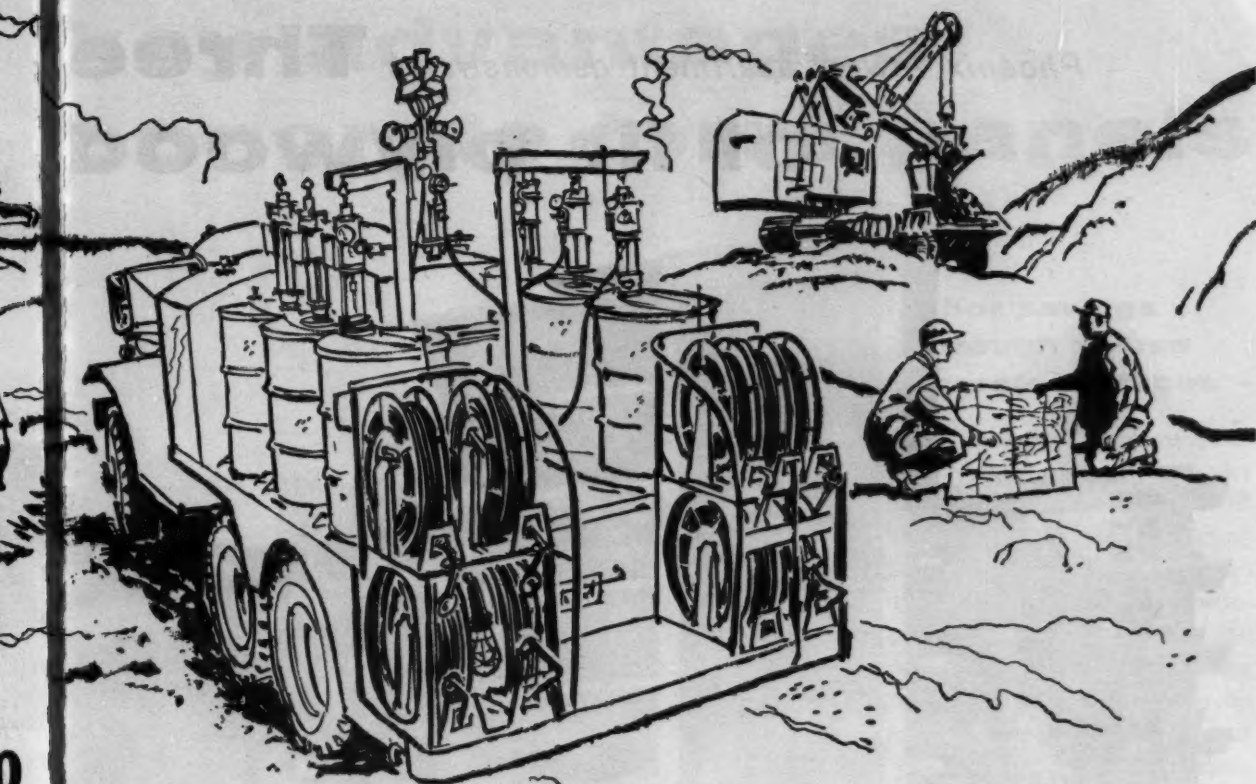
Quick filling of final drives, gear housings, transmission!



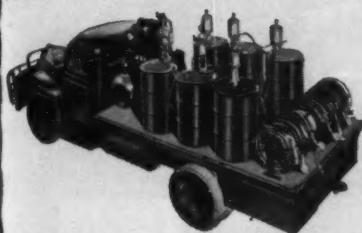
Air line equipment for on-the-job tire inflating, air cleaning!

Slow hand lubrication can be a dangerous bottleneck in keeping your job on schedule. Why take this chance when you can get all the low-cost protection of modern, power-operated high pressure lubrication with an Alemite Portable Service Station. Savings are tremendous: For every 1,000 pounds of grease you pump by hand, you can save as many as 239 man-hours with Alemite Portable Power Lubrication!

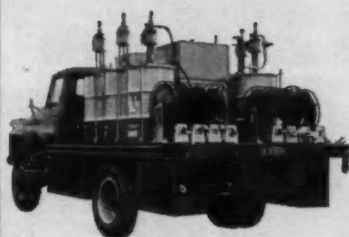
Your valuable rigs get round-the-clock protection with fast, efficient, on-the-job lubrication. You eliminate costly delays . . . end travel time to and from the grease shop . . . reduce chances of costly bearing failure. Whether your spread is large or small, an Alemite outfit can be custom-built from standard Alemite equipment to meet your particular needs.



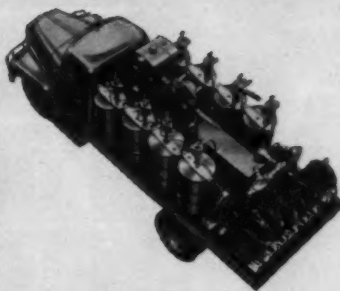
Tight Schedules



On a major New York thruway project, Alemite Portable Service Stations like this serviced rigs at night to keep them on the job all day long.



This Alemite outfit helped a large contractor build a Wisconsin Air Force flight strip in record time by cutting lubrication downtime on every rig.



A West Coast contractor working on a large dam project found power lubrication 64% faster than hand methods by using this 8-pump, 8-reel Alemite lube truck.



ALEMITE
DIVISION
STEWART-WARNER
CORPORATION

1850 Diversey Parkway, Chicago 14, Illinois



MAIL COUPON TODAY FOR FULL DETAILS!
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1850 Diversey Parkway, Chicago 14, Ill.

Please send me your illustrated catalog of Alemite Portable Service Stations.

Name

Company

Address

City Zone State



No engine oil wasted — delivers exact amount of oil required!



Fast, easy, high-pressure lubrication of all bearings equipped with hydraulic or button-head fittings!



Alemite Portable Service Stations Help Rigs Meet



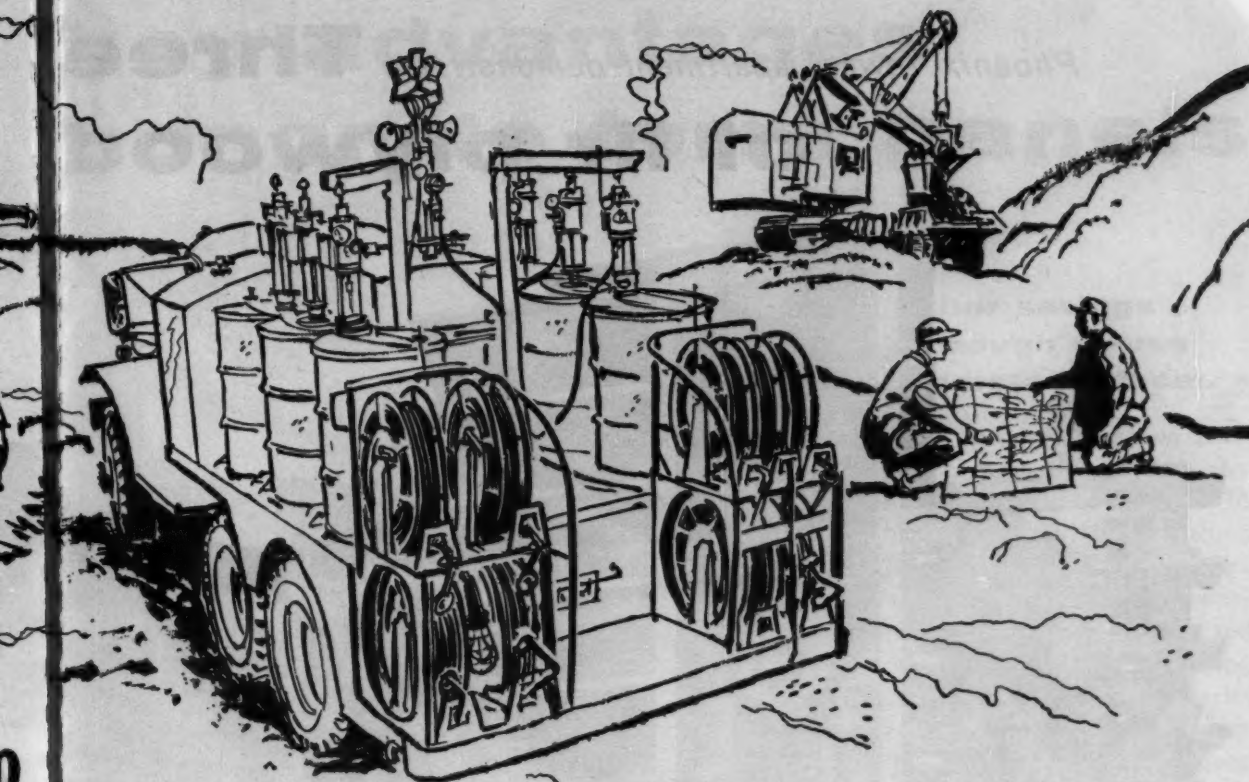
Quick filling of final drives, gear housings, transmission!



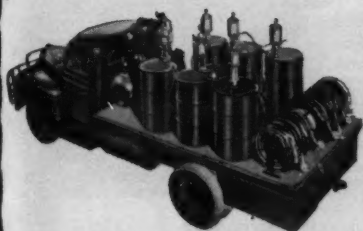
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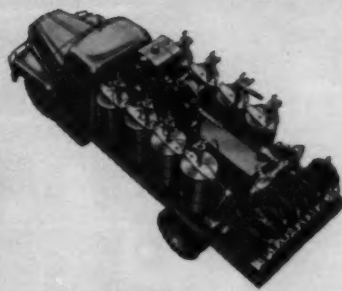
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Please send me your illustrated catalog of Alemite Portable Service Stations.

Name

Company

Address

City Zone State

Phoenix Towers apartment demonstrates **Three k**
of fir plywood o



PHOENIX TOWERS
LOCATION: Phoenix, Arizona
ARCHITECT: Ralph C. Harris, Chicago
CONTRACTOR:
Del E. Webb Construction Co.
Phoenix, Arizona

key advantages concrete form panels

- time and labor savings
- economy through re-use
- smooth concrete surfaces

Confirmed again on this 14-story cooperative apartment—the fact that fir plywood concrete forms offer advantages unmatched by any other material. In building Phoenix Towers, Del E. Webb Construction Co. used over 25,000 square feet of PlyForm and Overlaid fir plywood. F. L. McDowell, job superintendent, reports that form fabrication, stripping, and moving was fast and easy. Rubbing and finishing time was cut to a minimum due to the smooth architectural surfaces made possible by plywood. Phoenix Towers offers 60 luxury apartments in four wings, each planned to provide a maximum view of surrounding mountains and desert.



One floor was poured every two weeks, with plywood forms numbered and moved upward for each succeeding pour. Plywood was also used to form 120-car underground garage (left). Virtually no finishing was required before walls and ceilings were painted.



DOUGLAS FIR PLYWOOD ASSOCIATION

TACOMA 3, WASHINGTON

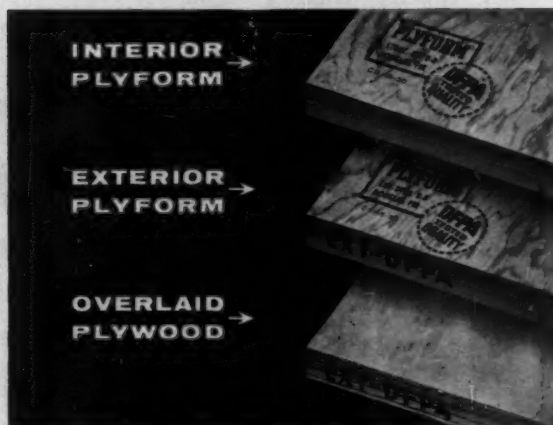
—a non-profit industry organization devoted to research, promotion and quality control

ALWAYS SPECIFY DFPA-QUALITY TRADEMARKED PLYWOOD. Grades manufactured expressly for concrete form work include:

INTERIOR PLYFORM®—standard concrete form grade plywood made with water-resistant glue. Gives multiple (up to 10-12) re-uses.

EXTERIOR PLYFORM®—standard concrete form grade plywood made with waterproof glue to give as many as 25 or more re-uses.

OVERLAID PLYWOOD—special panel with hard, glossy, plastic-like fused resin fiber surfaces. Forms smoothest concrete; up to 200 re-uses.





Thermoid THUNDERBIRD...

the toughest (*yet most flexible*) **air hose you've ever used**

Give Thermoid-Quaker THUNDERBIRD Wire-Braid Hose the works . . . the roughest kind of impact, twisting, crushing, inside pressures. It'll take everything you can deal out, and then some.

THUNDERBIRD takes this punishment while remaining the most flexible, non-kinking air hose you've set eyes upon. Accurately-controlled angle of wire braid assures this



extreme flexibility. Tough neoprene tube resists hot or cold oil. Yellow neoprene cover provides maximum abrasion-resistance and high visibility even in the dark.

Sizes from $\frac{3}{8}$ " to 4" I.D. Working pressures to 400 psi air or 2,000 psi water. Lengths to 50 feet. Ask your Thermoid distributor about THUNDERBIRD, or write Thermoid Division, H. K. Porter Company, Inc., Tacony & Comly Sts., Phila. 24, Pa.

THERMOID DIVISION

PORTER

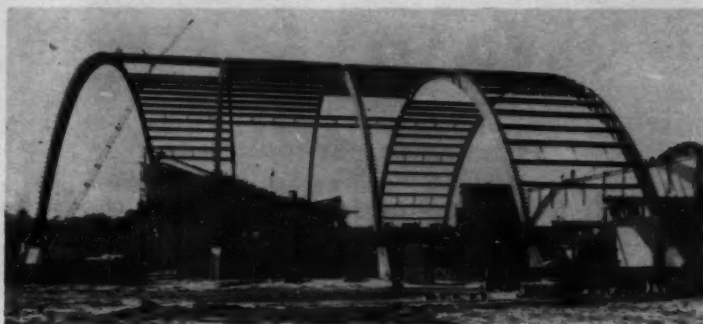
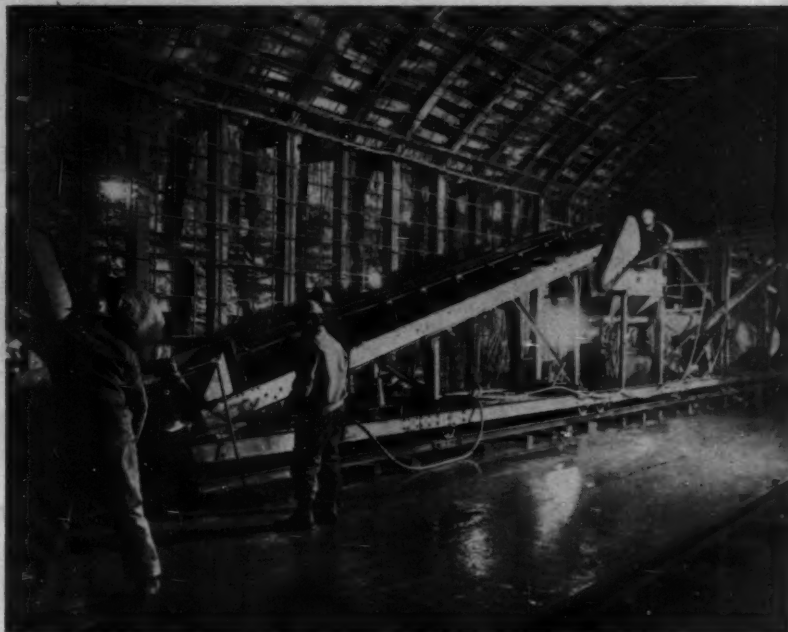
H. K. PORTER COMPANY, INC.

PORTER SERVES INDUSTRY : with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION; Copper and Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRATORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION, H. K. PORTER COMPANY DE MEXICO, S. A.; and in Canada, Refractories, "Disston" Tools, "Federal" Wires and Cables, "Nepconduct" Systems—H. K. PORTER COMPANY (CANADA) LTD.

Construction News in Pictures . . .

Tunnel Concreting

Merritt-Chapman & Scott Corp. places sidewall and arch concrete for the twin Fort Pitt Tunnels in Pittsburgh at a rate of 380 to 410 yd per shift. Transmixers dump onto a 36-in.-wide belt conveyor that delivers the concrete to a 2½ cu yd Blaw-Knox hopper above a Presweld pneumatic placer.



Record Timber Arches

Five laminated timber arches span 252 ft—a record for clear-span timber arches—to frame a jai alai arena at Daytona Beach, Fla. The arches are on 40-ft centers and rise 67 ft, 4 in. from the abutments to the center pins. Thomas & Slater, Inc., of Daytona Beach is the contractor. American Fabricators, Bellingham, Wash., fabricated the arches.

Long Lift Span

Crews of American Bridge Division of U.S. Steel float into place the world's longest vertical lift span. The 560-ft, 2,000-ton span is the final section of a new railroad bridge between Staten Island, N.Y., and New Jersey. In the raised position, it will be a maximum of 135 ft above water level. Installation of the span was completed in five days.

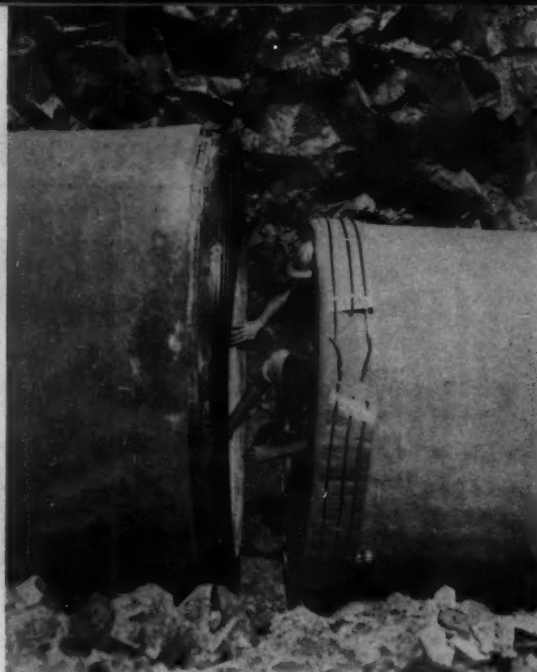
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CONSTRUCTION NEWS
IN PICTURES ... continued

No Welding Necessary

A new rubber gasket joint on the spigot end of the pipe section at the left provides a flexible, watertight coupling in a large diameter steel water transmission pipeline in southern California. The joint was developed by Kaiser Steel, manufacturer of the pipe. Young & Anderson of Brea, Calif., is the general contractor.

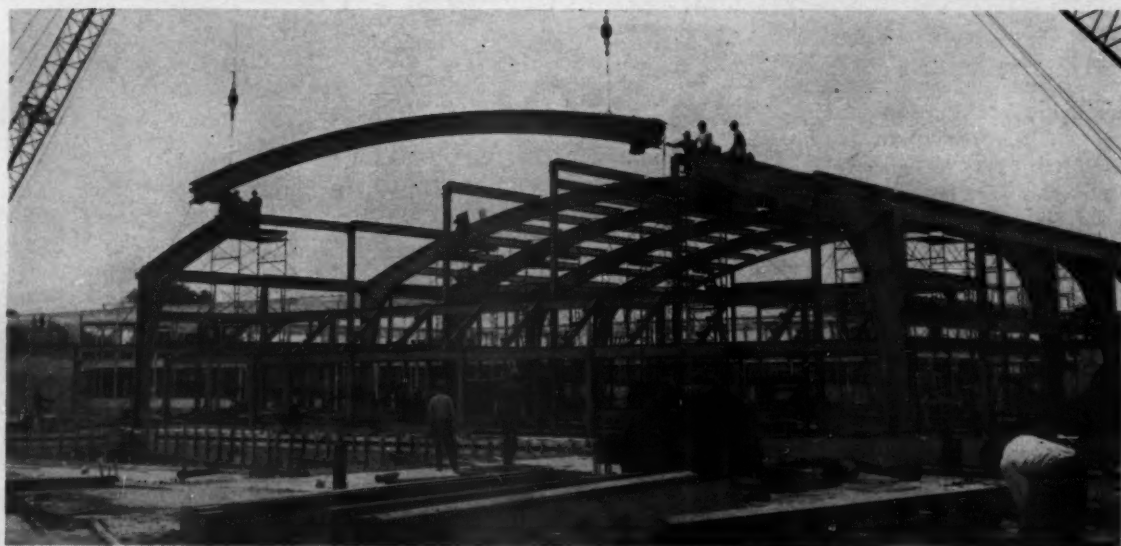


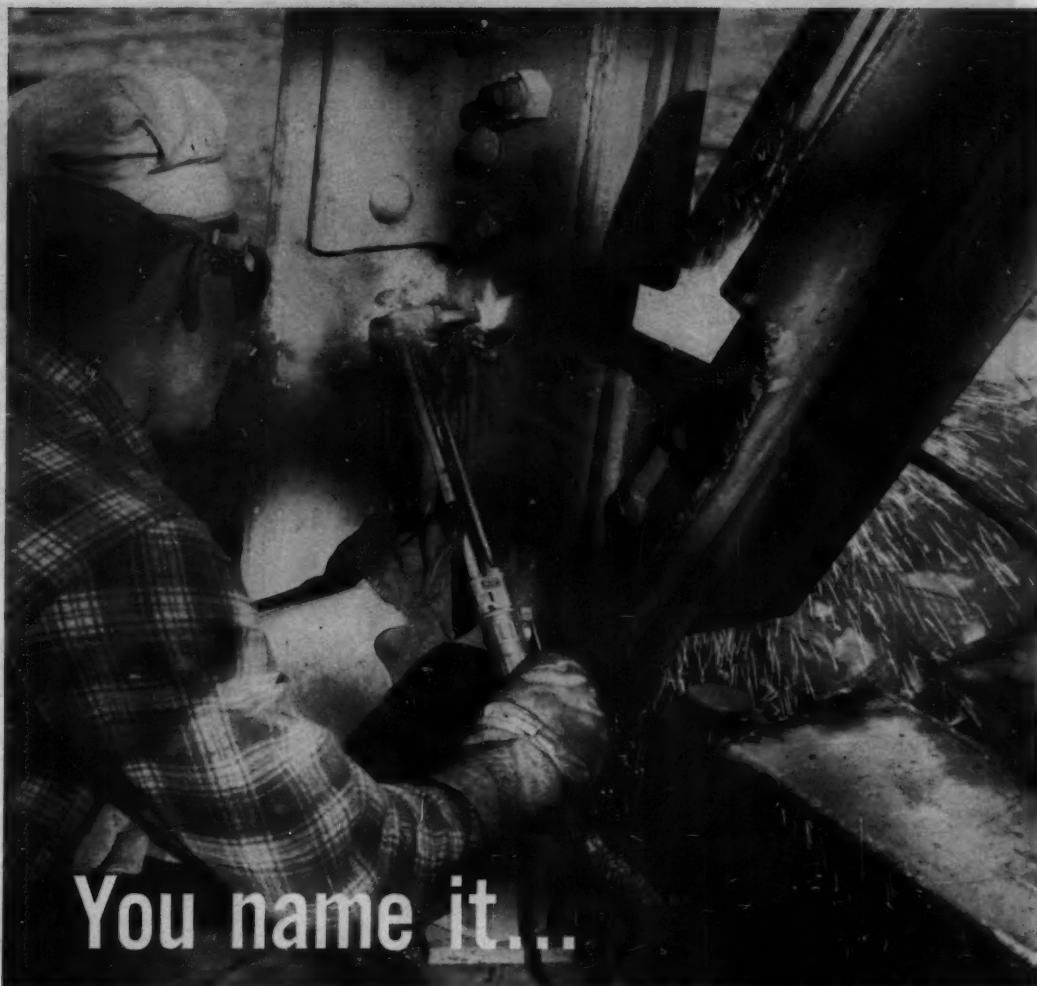
Hairpinning Steel

R. K. Collins Construction Co. of Plainview, Tex., has a neat way of bending reinforcing steel. They designed and built a bender that they can place on the ground wherever it is needed. For power, they remove the hydraulic cylinder from one lift arm of a Massey-Ferguson tractor shovel, put it in the bender, and go to work.

Framing for School (below)

A Bethlehem Steel Co. erection crew sets in place a six-ton rigid frame arched section 62 ft long for the new \$3.6-million high school at Cheetowaga N. Y. The rigid frames span 101 ft center-to-center of columns. Seven of them will support the roof over a gymnasium. Contractor is Siegfried Construction Co., of Buffalo.





You name it... Your LINDE Distributor supplies it!

For Every Welding and Cutting Job

For hand- or machine-cutting . . . light, medium, or heavy-duty welding and heating . . . flame treating . . . a complete line of torches to meet every need.

For every Fuel Gas Combination

Whatever flame you use . . . oxy-acetylene, oxy-propane, oxy-natural gas . . . there's a PUROX torch with full cutting nozzle or heating head selection to give you top value for every dollar.

Your LINDE Distributor carries a *complete* line of welding and cutting equipment, industrial gases, welding rods, supplies, and accessories. He handles only high-quality products of proved

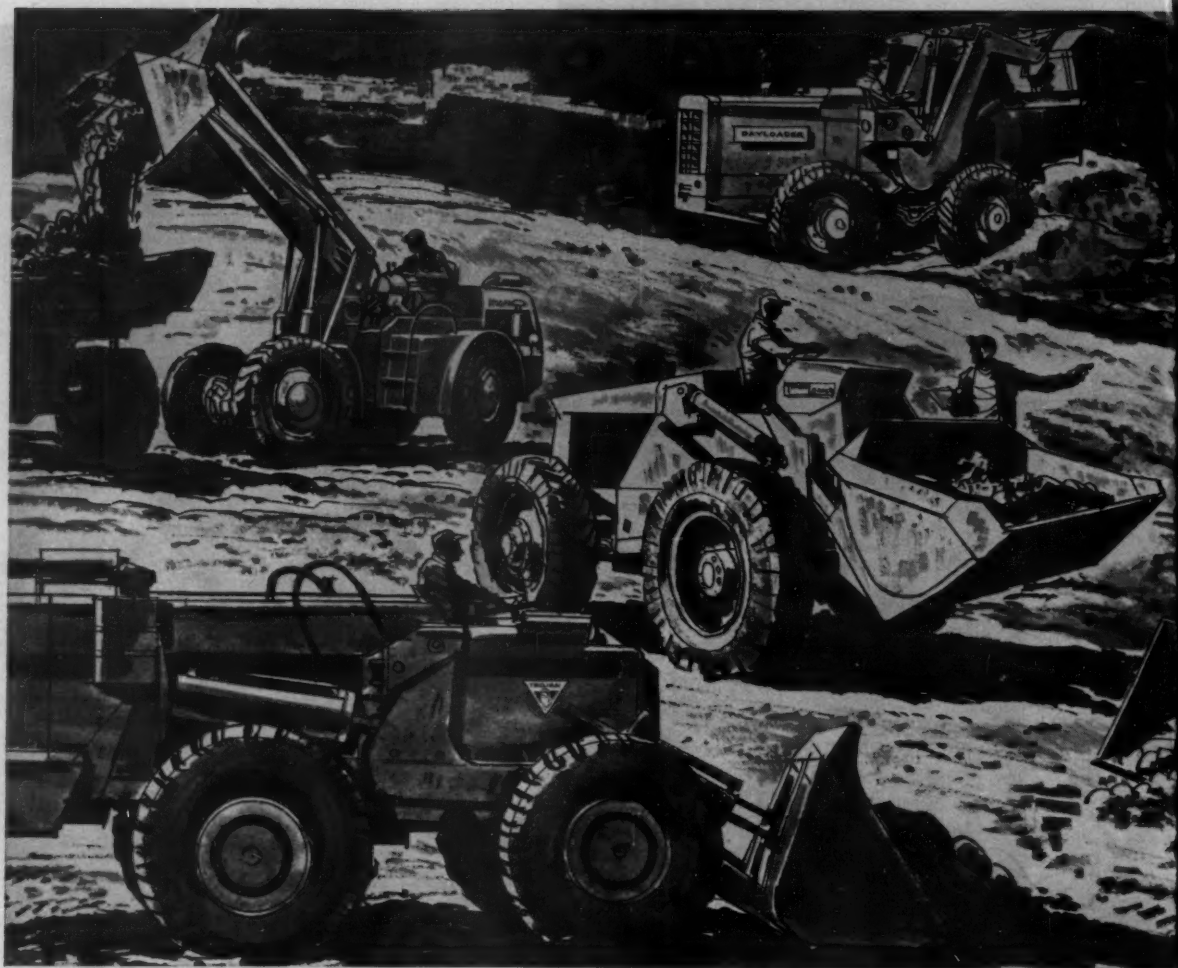
efficiency and recommends only those processes and methods best suited to your individual needs. He is an independent *local* businessman who concentrates on knowing what you are going to want and on having it ready for you. He is a welding supply *specialist*, with wide practical experience and intimate knowledge of local industry. His resources and all the benefits of LINDE COMPANY's 50-odd years of welding and cutting leadership are as near to you as your telephone.

Call your local LINDE Distributor today or write for catalogs or further information. LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. *In Canada:* Linde Company, Division of Union Carbide Canada Limited, Toronto.

**Look to LINDE . . . for the Best
in Welding and Cutting Apparatus**

The terms "Linde", "Purox", and "Union Carbide" are registered trade-marks of Union Carbide Corporation.





9 out of 10 loader builders

Because TORQMATIC makes the load go faster

Call the roll of front-end loader manufacturers and you'll find that 9 out of 10 of them—Case, Chaseside, Hough, Scoopmobile, Nelson, Pettibone-Mulliken, Thew-Lorain, Tractomotive and Trojan—use TORQMATIC DRIVES.

This overwhelming acceptance is proof positive that the Allison TORQMATIC CRT-3331 fulfills all requirements of leading loader manufacturers. It was designed *specifically* for loaders, combining the modern thinking of loader manufacturers with our own 11 years' experience in designing and building TORQMATIC DRIVES.

And there's reason aplenty for this acceptance—reasons that put you money ahead when you buy a loader equipped with an Allison TORQMATIC DRIVE.

For instance, TORQMATIC gives you "Sense-Feel" con-

trol. So the operator can "feel the load" when he's reversing his direction of travel. That means better, surer loader control—more round trips per shift—greater productivity and profit per man and machine.

TORQMATIC gives you unitized design with the torque converter and hydraulic transmission in *one compact unit*. This eliminates the need for piping and hoses which can plug, crack or leak. And built right into the single-unit TORQMATIC DRIVE you find Allison's famous maintenance-free clutches.

Only TORQMATIC gives you 3 speeds forward and 3 reverse, with gear ratios exactly tailored to the job. *Saves shifts—speeds job cycles*. Loaders equipped with 3-speed TORQMATIC dig, crowd, load, travel and dump far faster.



use **Torqmatic Drive**

What's more, TORQMATIC completely eliminates shift shock. It's done through the use of planetary gearing and a tapered shift. So equipment lasts longer, runs better, is subject to far less wear and tear.

Want to know more? Your loader salesman has the whole story. Make sure you get it before you sign your next loader order.

Allison Division of General Motors, Indianapolis 6, Indiana
In Canada: GENERAL MOTORS DIESEL LIMITED, London, Ontario

**THE MODERN DRIVE FOR
MODERN EQUIPMENT**

Allison
TORQMATIC® DRIVES



POUND FOR POUND THE BIGGEST

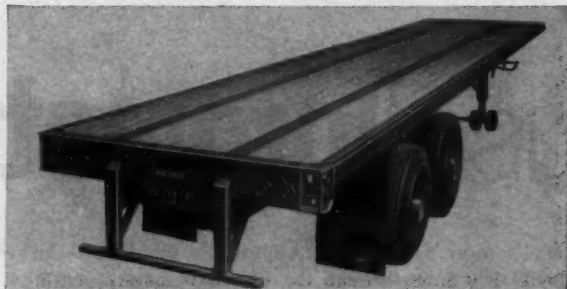
*Fruehauf Builds The Only Complete Line of
Construction Hauling Equipment*



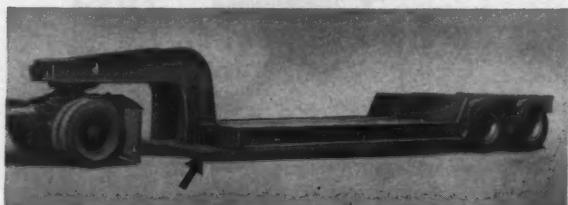
1 Single-Axle Cable Dump—1,000 pounds lighter than previous models, this Fruehauf-Schonrock Cable Dump is your choice for fast, efficient low-cost handling of gravel, sand and dirt. Tandem models and rock bodies available.



2 Multi-Purpose Platform—Ideally suited for hauling heavy building materials, light machinery, or bulky installations. Available in lengths from 27' to 42'.



3 Workhorse Platform Trailer—If it can be moved you can haul it on a Fruehauf Workhorse Platform. Rugged, yet 1,200 pounds lighter than ordinary, earlier models.



4 Removable Gooseneck Carryall — These exclusive Fruehauf Removable Gooseneck Carryalls cut loading time for heavy construction equipment to less than 15 minutes.

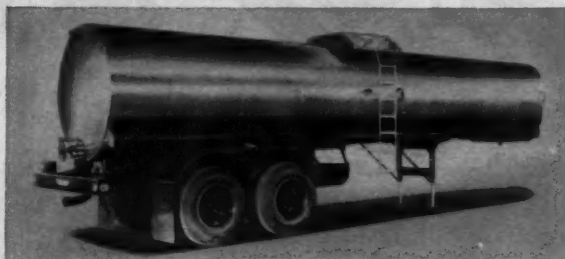


5 Lightweight 35-Ton Carryall—This new lightweight, lower-cost carryall features wide frame design for better load distribution, shorter gooseneck for maneuverability.

MONEY-MAKERS IN THE CONSTRUCTION BUSINESS!



8 Hopper-Type Dump—For round-the-clock hauling of sand, gravel, or aggregates over all kinds of terrain. Has rugged frameless steel body, with steeply-pitched inner surfaces for faster, more uniform unloading.



9 Hot Commodity Tank—Whether your hot cargo is asphalt, road oil, or a similar commodity, the lower Trailer weight of Fruehauf tanks reduces per-ton hauling costs.

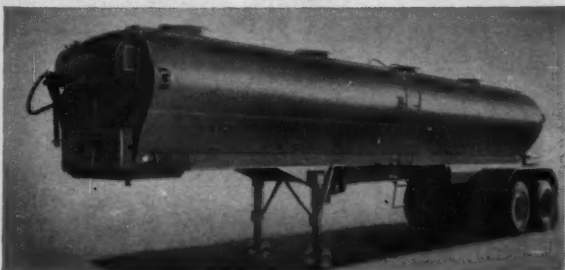


6 Frameless Aluminum Hoist-Type Dump—Also available in steel, with either single or twin-front mounted or under-mounted telescopic hoists.



10 "Airlide" Pressure Tank—Lower initial cost, faster unloading of aerated cement and barites, are two big features of Fruehauf's new "Airlide" Pressure Tank-Trailer.

*"Airlide"—Trademark, Fuller Co.



7 Screw-Type Bulk Cement Tank—Designed for faster discharge of cement and similar commodities. Available with either twin-screw or twin and-a-half conveyors.

*For Over 45 Years No Fruehauf
Unit Has Ever Been An "Orphan"*

World's Largest Builder of Truck-Trailers
FRUEHAUF TRAILER COMPANY
10949 Harper Avenue • Detroit 32, Michigan

Send full facts, with no obligation, on Fruehauf
units circled: 1 2 3 4 5 6 7 8 9 10

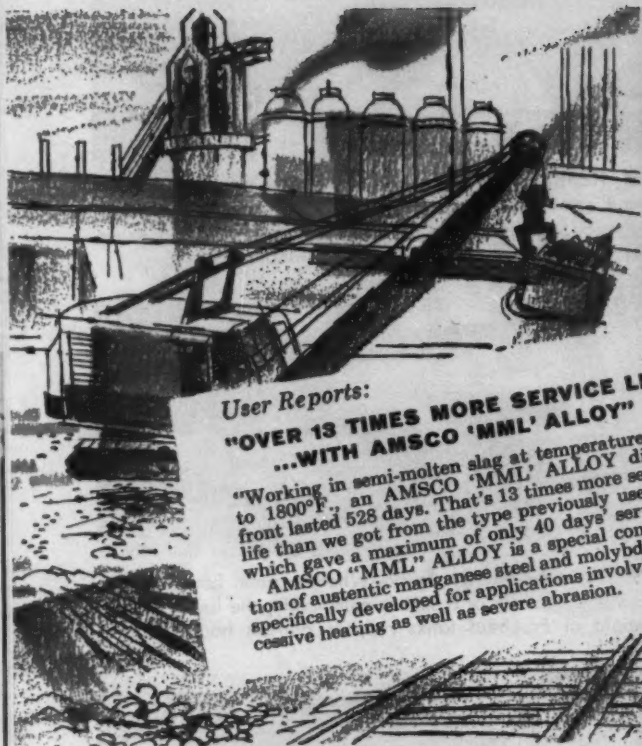
NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

How AMSCO helps you MOVE M



User Reports:

"OVER 13 TIMES MORE SERVICE LIFE ...WITH AMSCO 'MML' ALLOY"

"Working in semi-molten slag at temperatures up to 1800°F., an AMSCO 'MML' ALLOY dipper front lasted 528 days. That's 13 times more service life than we got from the type previously used... which gave a maximum of only 40 days' service."

AMSCO "MML" ALLOY is a special combination of austenitic manganese steel and molybdenum, specifically developed for applications involving excessive heating as well as severe abrasion.



User Reports:

"AMSCO SIMPLEX TOOTH GIVES 18 WEEKS EXTRA SERVICE"

"We're getting between 15 and 18 weeks extra service by using AMSCO Simplex dipper teeth," reports Mr. Fred Weber, Jr., Vice-President of Vigus Quarries, St. Louis, Missouri. "This gives us almost 4 times the service life we've been getting from standard teeth in our rugged limestone quarrying operation."

Mr. Weber also found that 2-part, reversible Simplex dipper teeth were so much easier and quicker to replace that his shovels were back on the job in no time.



AME

B

MORE TONS PER DOLLAR

*For rugged digging, crushing,
pumping, or rebuilding jobs...
it pays to ASK for AMSCO!*

AMSCO's sole job is to help you fight wear caused by impact and abrasion. AMSCO Manganese Steel—"the toughest steel known"—is today's number one choice for long-lasting dipper, dipper parts, crushers, tractor parts.

AMSCO Alloys, developed to meet unusual wear problems, add extra service life under

special and very severe operating conditions.

AMSCO Hardfacing Materials permit economical build-up or repair of worn parts—at a fraction of the cost of new parts. Use this specialized know-how and broad line of "wear-fighting" products to help *your* equipment move more tons per dollar. Ask for AMSCO!



NOW...WELD MANGANESE AS EASILY AS MILD STEEL

"We're getting just the kind of welds and build-up we want with good cost saving to boot," says a user of Nicro-Mang rod. From all over, in a variety of hardfacing applications, reports of success with AMSCO Nicro-MANG are coming in. Users like the stable arc, and wide range of arc length... the non-popping, the easy removal of slag... and above all the fast build-up. For high strength, superior crack resistance, and easy welding, Nicro-Mang is unbeatable for fabrication and build-up of manganese steel.



"29 YEARS WITH THE SAME 8" AMSCO PUMP"

Haskell Peel, Plant Superintendent at Consolidated Gravel Company, Columbus, Georgia, has shared many experiences with his 8" AMSCO PUMP. One of his favorites is the time that he and his pump almost dried out a lake to recover a sunken dredge. He hooked the 8" AMSCO to more than 1,000 ft. of 10" pipe, and ran it continuously for three days. No wonder the pump is his pet... it's been doing the job, pumping 75% sand and 25% gravel, for more than 29 years.

AMERICAN

Brake Shoe

COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

Other Plants in: Denver • Los Angeles • New Castle, Del. • Oakland, California • St. Louis

In Canada: Joliette Steel and Manitoba Steel Foundry Divisions

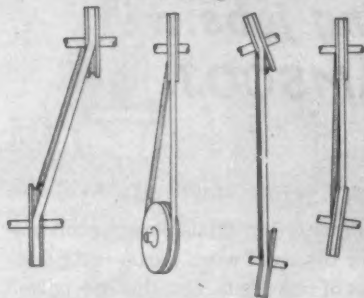
Welding products distributed by Canadian Liquid Air Co., Ltd.

B.F. Goodrich

V belt briefs

TIPS ON THE CARE, MAINTENANCE AND SELECTION OF V BELTS FOR INDUSTRY

Belts that go straight live longer



When V belts enter and leave the pulley grooves at an angle, it causes the sides of the belts and pulley sidewalls to wear excessively. This condition can be caused by drive shafts that aren't parallel, by sheaves that are out of line, by wobbly sheaves, or by a bent drive shaft.

Simple instructions on how to make sure that the drives are parallel, and to check for wobbly sheaves or bent drive shafts can be found in the B.F. Goodrich V belt maintenance manual. Ask your B.F. Goodrich distributor for a copy.

What do V-belt sizes mean?

V belts are marked with a letter which indicates their width across the top and a number to indicate their length. Standard belt widths are coded: A, B, C, D and E.

Here are the belt cross sections and minimum recommended pitch diameters to obtain maximum V-belt life.

Section	Recommended Range of Small Sheave Diameters (Inches)	Absolute Minimum Pitch Diameter (Inches)
A	3.0" to 5.0"	2.6
B	5.4" to 7.5"	4.6
C	9.0" to 12.0"	7.0
D	13.0" to 20.0"	12.0
E	21.0" to 28.0"	18.0

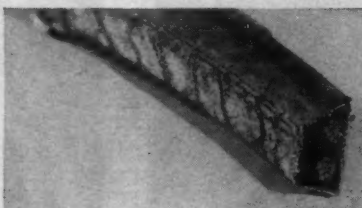
Which is the right way to install V belts?



V belt at left is not being installed correctly. When a belt is forced into the sheave with a screwdriver or any other wedge, the outer fabric is often ruptured and cords broken. To install V belts correctly, move driver unit forward so belts can be slipped easily into sheave groove without damage.

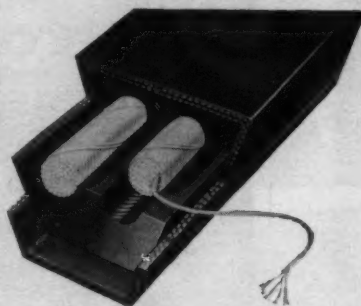


What caused this V belt failure?



Answer: There could be several causes: Severe back bend idlers, improper storage, or excessive ambient operating temperatures. To prevent, check storage conditions. If back bend idler cannot be avoided, figure number of belts again with additional service factor. (See B.F. Goodrich Multi-V belt handbook.) Avoid ambient temperatures over 150°.

Here's why Grommet belts grip better



See all the rubber surrounding the twin grommets in this B.F. Goodrich belt? It has more rubber in relation to belt size than any other belt. Grommets are cord loops made like twisted cables, except they are endless. Because these grommets are endless, have no stiff overlapping cords, they are more flexible, grip the sheaves better. Size for size, Grommet belts give 1/2 more gripping power with less slip.

Ask a factory-trained specialist

For help in selecting V belts for any kind of service, call the man who is a specialist in V belts—your B.F. Goodrich distributor. He can help you cut costs by getting longer life from your V belt drives. B.F. Goodrich Industrial Products Co., Dept. M-630, Akron 18, Ohio.



Photo courtesy of West Virginia Brick Co., Charleston, W. Va.

Mixing clay for bricks batters V belts—Dust, dampness and terrific shock loads were wearing belts out in a hurry at this brick plant. The belts drive a machine which mixes thick clay and extrudes it as bricks. Because B.F. Goodrich belts were giving good service on other installations, the plant superintendent tried them on this machine. That was over 1 1/2 years ago. Belts are still going strong, show little wear, required a minimum of maintenance.

B.F. Goodrich v belts

Are You Inconsistent?

WHAT KIND OF A CAR do you drive? Ford? Cadillac? DeSoto? Chances are, whatever you drive, that you make sure it is serviced regularly by a competent mechanic. And you probably insist that he "follow the book" in lubricating it, checking it, and adjusting it. Chances are, too, that you keep your car cleaned and polished.

It makes good sense to do these things. And this is more than just a matter of taking pride in your car's performance and appearance. It will insure your car's dependably taking you where you want to go, and it will enhance its trade-in value.

Now, why is it that a contractor will insist on his car being kept in tip-top shape, yet will be comparatively disinterested in seeing that his construction machinery is properly maintained? The average contractor's investment in equipment is large. The investment in maintenance necessary to insure a long and productive life for that equipment is small. Even so, too many contracting firms seem unwilling to devote the required money and effort to it.

To help you with this problem, we have enlisted the aid of some of the top service experts of equipment manufacturing companies. In the pages that follow, they give straightforward advice on maintenance of fifteen different types of construction machinery.

These experts state facts. They want to help you. They know that incorrect or neglected maintenance can cause premature failures, complaints from you, headaches for them. If you follow their advice, both groups will benefit.

And you will find that their advice is simple to follow. Basically, it calls for proper lubrication at the right points at the correct intervals, periodic checks and adjustments of various parts of the machine, and correct operation.

This last is an item often overlooked. Yet even the best machine, given excellent preventive maintenance, will give poor service if abused by the operator.

So, unless you are satisfied that you are getting out of your machines all the values the manufacturer built into them, and that your maintenance program cannot be improved, heed what our experts have to say. They will help you be low bidder—at a profit—more often.

**Every page of this issue
has been perforated
for easy removal and filing.**



About the Author

RICHARD E. BERGER has been with Caterpillar Tractor Co since 1948. He is Service Engineer in the Tractor Section working with track-type tractors and Traxcavators and their components. He has attended Purdue University and was graduated from Bradley University in 1948.

This expert warns about the trouble loose track shoes can cause . . .

CRAWLER TRACTORS

HOW MUCH MONEY are you wasting each year to "lock the barn after the horse is stolen?" Major repairs and loss of machine productive time can cost you several thousand dollars each year.

With earthmoving bids becoming more and more competitive, a contractor has to analyze his expenses to find areas for possible savings. One area open to him for savings is in his maintenance bills.

Key to these savings is an intensified productive maintenance program that will keep the small problem from growing into a major repair bill and result in loss of the machine's productive ability for several days.

A few minutes spent each day on every machine in the spread will allow mechanics to find the problems before they get out of hand. An hour off the job at the start of trouble can mean additional days of production with the machine.

Take such an apparently minor and commonplace thing as mud and dirt packed tightly into the exposed recoil springs of a crawler tractor. If this is not cleaned out, idler travel and recoil action becomes restricted. This over-stresses track link assemblies, recoil mechanisms and even the final drive assemblies. Since this causes added wear on all the com-

ponents, repairs will be needed much sooner.

Track Adjustment

Another all too common trouble is improper track adjustment. When tracks are too tight or too loose, the machine is headed for expensive repairs unless corrective action is taken quickly.

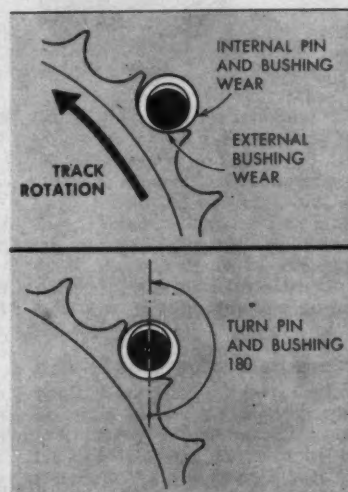
It takes only a few minutes of work to adjust the tracks properly so there is approximately 1 to 1½ in. of sag. For hydraulic adjusters, it requires only a small amount of added lubricant to tighten the tracks, or the turning of a valve to release lubricant to loosen them.

Loose tracks can lead to a variety of troubles. For one thing, loose tracks don't maintain alignment well. This leads to unnecessary wear on the sides of roller and idler flanges as well as wear on the sides of links and bushings. Loose tracks also tend to come off when the tractor turns, and they "whip" at high speeds. This puts extra heavy loads on carrier rollers and their support brackets.

Tight tracks can be every bit as bad, or worse. Not only do they actually rob a tractor of working horsepower, tight tracks place unnecessarily high strains on all components and accelerate the normal wear rate.

Severely tight track adjustments can cause the tracks to "run hot." This leads to drawing of vital hardness from pins and bushings. If these lose their built-in hardness, the wear rate is speeded up, and costly repairs are soon in order.

Because all parts of a tractor are highly interdependent, tight



TURNING WORN PINS and bushings 180 deg gives them a new wearing surface and prevents excessive stretching of tracks. Stretched tracks permit bushings to ride up on sprocket teeth causing added wear.

tracks also pass on added strains to the final drive gears, hubs, and bearings. This means that not only are components wearing faster than they should, but that the operating cost of the machine in relation to its production is greatly increased.

Pins and Bushings

Wear on pins and bushings close to the master pin often can be reduced by periodic replacement of the master pin. This is good practice anyway because master pins have less contact area and tend to wear faster than other pins and bushings.

Unless pins and bushings are worn beyond recommended limits or are cracked, they should be turned (that is, rotated 180 deg) if the track is still too loose after being adjusted to take up as much slack as possible. Since both pins and bushings wear primarily on the side contacting the sprocket, turning gives them a new wearing surface. Turning of pins also tightens the track.

Rollers and Sprockets

Just as pins and bushings should be turned, so should track rollers be switched. Track rollers wear at varying rates depending on where they are located on the track roller frame. Switching them will even out the wear rate over the entire set of rollers. This requires relatively little time and more than pays for itself in added life.

When rollers wear more on one flange than on the other, they also should be switched end-for-end. Especially rapid wear on one flange is most likely to take place when wide shoes are used or when the shoes on a push-tractor overhang the scraper cut.

It is also particularly important to be sure that the front and rear rollers have flanges in top condition because these guide the tracks onto the idler and sprocket and under the intermediate rollers. Periodic inspection of rollers will indicate wear rates and will show if there is leakage of the lubricant.

Wear on sprockets is usually restricted to the teeth of the rims. When the tractor is used primarily in forward gear, the wear is almost all on one side of the tooth. Switching of the sprockets will add considerably to their service life by equalizing the wear rates.

Idler Alignment

Improperly adjusted idlers can be another source of trouble. A misaligned idler causes undue wear on the center flange, the sides of track links and roller flanges, and on the track roller guards.

Adjustments for misaligned idlers are relatively simple, requiring only proper shimming. If the wear is on one side only, the idler probably is not centered and can be located properly by adding or taking off shims.

When the wear from a misaligned idler is on both sides of the center flange, there can be several reasons for the trouble. The idler may be "cocked" out of either vertical or longitudinal alignment—or both.

If there is vertical misalignment, it could result from unevenly worn wear strips. Some tractors are equipped with shims located between the upper hook on the end collar and the top of the end bearings. On tractors not so fitted, it is necessary to put on new wear strips.

Longitudinal misalignment is not as common as vertical misalignment. It usually is caused by extremely severe usage of the tractor that has resulted in bending of the idler shaft, the yoke arms, recoil shaft, recoil spring bracket, or even the roller frame. When correcting for it, checks should be made for these faults.

Track Shoes

In line with good productive maintenance procedures is the proper selection of equipment. Various tools and components are designed with one or more primary jobs in mind. If used for other tasks, the results may not be entirely satisfactory either from a production or a service life point of view.

This is as true for track shoe selection as for any other component on a track type tractor. Just a few minutes spent analyzing exactly what shoe will work best on a given job with certain soil conditions will save money in repairs at a future date and will give higher overall productivity.

The basic rule in track-shoe selection is "keep them as narrow as possible." It is not necessary to sacrifice needed flotation, but narrow track shoes wear longer and impose less strain and wear on other components than do wide



TRACK SHOE BOLTS must be kept tight to prevent sliding or side-play. Loose track shoe bolts permit the shoes to slip, cause excessive stretching of tracks, and put added wear on the bolts.

shoes. Overhang causes wear on the links, and the greater the overhang the greater the wear.

This is particularly true on push-tractors. Often the overhang extends beyond the scraper cut, putting the track shoe on an angle. This shifts all the contact between the links and rollers to the inside roller flanges and causes rapid wear. For push-loading, the offset shoe is generally the most successful, because the outside overhang is reduced with no sacrifice in flotation.

For general purpose crawler tractor work, such as dozing or ripping, the standard grouser is usually the most desirable of all the different types available to the equipment owner. If the machine will be working on unduly soft underfooting, then a wider shoe is called for. By the same token, if the soil is highly abrasive or rocky, specially toughened shoes or shoes containing work-hardening manganese should be used.

When grousers become sufficiently worn—about halfway down—they should be reconditioned by welding on either a preformed grouser bar or steel bar stock to restore the original height. Such corrective action should be taken before wear has become great enough to reduce the strength of the shoe.

Track shoe bolts must be kept tight to prevent sliding or side-play. If they are not kept tight, there will be undue wear on the bolts and bolt holes. This will stretch the tracks as well as weaken the components.

CRAWLER TRACTORS



MAKE AND MODEL		GENERAL DATA												STANDARD TRACKS			MAX. DRAWBAR PULL, LBS. (NORMAL GOVERNED ENGINE RPM)						
		Length, in.	Height, in.	Width, in.	Grip, in.	Weight, lbs.	Ground Clearance, in.	Type Standing	Turning Radius, in.	Price, Base, FOB, Factory	Drawbar HP Rating	Ball HP Rating	Net Engine HP Rating	No. of Shocks, Each Side	Length, in.	Width, in.	Ground Clearance, in.	1st	2nd	3rd	4th	5th	6th
1	ALLIS-CHALMERS HD-6	127	69	70	60	12,000	11 1/4	Mesh, Mech. Overhaul	89 1/4		52	52	605	34	66 3/8	15	1,720	12,640	7,900	5,550	4,450	2,975	9,700
2	HD-11	154	84	96	74	21,000	13 5/16		105		77	94	99	36	85 3/4	16	2,744	20,470	13,410	9,970	6,800	5,540	3,900
3	HD-16A	170	90	96	74	31,500	14 3/8	Hyd.	113		125	141	148	30	96 5/16	20	3,853	31,100	21,735	15,105	11,270	9,465	6,950
4	HD-16C	170	90	96	74	31,000	14 3/8	Hyd.	113		-	-	-	30	96 1/16	20	3,853	60,000	47,000	26,000	(Torque Converter)		
5	HD-21	197	99	100	84	46,500	16 1/8	Hyd.	129		-	-	225	40	120 1/8	24	5,706	30,000	25,500	(Torque Converter)			
6	J.I. CASE 450	100	56	60	48	4,800	16	DIFFERENTIAL	64	3,750	-	31	42	31	57	11	1,254	5,600	3,500	2,130	-	-	-
7	530	101	71	61	48	5,215	16		64	4,904	35	-	50	31	57	13	1,482	11,200	7,180	2,600	(Torque Converter)		
8	520-D	101	71	61	48	5,375	16	Controlled Ball Trans.	64	5,742	31.5	-	45	31	57	13	1,482	10,000	6,400	2,300	(Torque Converter)		
9	600	105	62 1/2	63	49	6,300	15 1/2		80	7,027	37	-	54	34	62 5/8	14	1,753.5	15,800	9,000	7,700	4,450	(Torque Converter)	
10	600D	105	62 1/2	63	49	7,200	15 1/2	80	8,017	37	-	54	34	62 5/8	14	1,753.5	15,800	9,000	7,700	4,450	(Torque Converter)		
11	800D	116 1/2	71 1/2	69	54	11,200	18 1/2	110	10,105	48	-	67.5	37	73	15	2,190	26,700	11,700	10,000	5,600	(Torque Converter)		
12	1000	115	72 5/8	75	60	13,500	18 1/2	114	11,706	63.5	-	87	39	79	16	2,528	25,400	14,400	12,230	6,770	(Torque Converter)		
13	CATERPILLAR D4	120 1/4	69 1/4	62	44	10,505	11 1/2	CLUTCH	75	8,000	50	51	-	31	61	13	1,589	30,700	7,770	6,000	4,630	2,800	-
14	D6	147	75	79	60	17,246	12 1/4		110	11,000	75	85	-	39	85 3/4	16	2,744	19,000	12,200	8,400	5,770	4,000	-
15	D7	168	81	97	74	26,555	15 1/2		116	11,200	112	-	-	37	94 3/8	20	3,775	33,250	22,070	14,700	9,620	6,910	-
16	D8	205	94	109.5	84	46,102	19 7/8		125	18,000	180	-	-	39	114 1/4	22	5,946	52,250	38,700	27,000	20,450	15,050	10,000
17	D8TC	205	94	109.5	84	48,875	19 7/8		125	18,000	-	-	225	39	114 1/4	22	5,946						
18	D9	235	105	119	90	57,843	20 1/4		140	26,000	-	-	-	43	129 3/4	24	6,222	68,000	57,500	36,600	24,800	20,250	13,450
19	D9TC	235	105	119	90	57,795	20 1/4		140	26,000	-	-	320	43	129 3/4	24	6,222						
20	JOHN DEERE 430C (4-Roller) (a)	102	69	56	44-46	4,475	12	Clutch	72		24.1 (c)	29.7 (d)	32 (e)	31	56	10	1,120	4,802	3,964	2,924	1,624	-	-
21	440C	106	66	61	48	5,500	13	Clutch	78		26 (c)	32 (d)	37.25 (e)	36	69	10	1,385	-	-	-	-	-	-
22	440C2	106	66	61	48	6,150	13	Clutch	78		26 (c)	32 (d)	37.25 (e)	36	69	10	1,385	-	-	-	-	-	-
23	EIMCO 600	71	28	55	45	6,900	6	Twin Motors Underdrive Trans.	45	5,570 (g)	-	25	-	28	43 7/8	9	790						(Torque Motors 10,000 Lbs. Max. Zero Track Slippage)
24	100	138	90	76 1/2	60 7/4	18,000/18,000	17		70	10,000-10,000/11,200-74 (h)	-	-	100 (i)	37	80	16	2,800	33,000	10,000				(Torque Converter)
25	105	151	90	94	74	29,900	11		89	13,700 (j)	-	-	143 (k)	40	95	20	3,800	57,000	30,000				
26	105T	151	90	94	74	29,500	11		89	13,700 (l)	-	-	156 (m)	40	95	20	3,800	64,000	34,000				
27	106	151	90	96	74	32,000	11		89	23,800 (n)	-	-	205 (o)	40	95	22	4,100	64,000	34,000				
28	EUCALD TC12 (2) (p)	195	109	137	110	60,000	20	Power To Each Track Hyd. Boost Clutch	115		-	-	425	43	131	27	7,074						(Torque Converter)
29	C6	190	97	100	78	42,000	12.5		120		-	-	211	43	115.2	22	5,069						
30	INTERNATIONAL T-340	106	52	48	38	5,620	12	Planet Power	65	3,790	31.0	35	40	35	66	10	1,320	5,320	5,120	3,800	2,590	1,790	-
31	T-6	100	67	53	40	5,650	10 3/4		72	5,745	41.5	50.6	-	36	58 5/8	12	1,670	8,714	6,618	4,948	3,480	2,337	-
32	TD-6	109	69	53	40	8,105	8 3/4	CLUTCH	65	6,700	42.3	-	52	36	58 5/8	12	1,666	8,700	6,625	4,485	3,580	2,400	-
33	TD-9	117	74	59	44	8,925	10 3/8		74	7,511	55.7	-	66	36	69 3/8	13	1,805	8,700	6,625	4,485	3,580	2,400	-
34	TD-15	151	82	89	62	11,800	11	Power Assist.	86	9,712	55.7	-	105	39	80 1/4	16	2,658	11,720	8,400	5,200	4,300	2,800	-
35	TD-20	167	89	94	74	21,950	14		104	15,631	111	-	134	40	94	20	3,700	27,800	21,000	17,000	12,000	8,100	4,600
36	TD-24	182	95	102	80	41,320	13 7/8	Planet Power	118	29,822	175.1	-	202	42	117 1/4	22	5,159	41,130	32,327	26,000	20,207	14,500	10,900
37	TD-24-TC	182	95	102	80	42,215	13 7/8		118	32,717	-	-	202	42	117 1/4	22	5,159						
38	MINNEAPOLIS-MOLINE 2 Star	117	64.5	64	52	9,130	11 1/2	Clutch	74 1/2	6,944	-	-	57	34	74 1/2	12	1,706	20,000	10,000	13,000	8,000	4,500	T. Conv.
39	OLIVER OC4-36-42	107	55	52	42	4,805 (m)	10 1/2	Cont. D.H.E. & Clutch Cont. D.H.E. & Clutch	64	3,306 (n)	24.06	26.47	-	32	56 1/8	10	1,122	4,986	3,920	2,270	1,261	-	-
40	OC4-30-42	107	55	52	42	4,800 (m)	10 1/2		64	3,306 (n)	24.75	27.31	-	32	56 1/8	10	1,122	5,124	3,961	2,614	1,489	-	-
41	OC-60	122	56	56	42	5,565	20	Controlled D.H.E.	80	5,865	37.4	37.4	-	33	54 1/8	8	866	6,625	5,620	4,010	2,825	2,230	990
42	OC-60	122	56	56	42	5,705	20		80	4,839	34.7	38	-	33	54 1/8	8	866	6,779	5,204	3,708	2,719	2,104	-
43	OC-120	110	58	76	60	10,585	11 3/4	Power Turn	91	6,583	53.1	60.3	-	33	71 1/16	14	1,900	11,390	7,801	5,302	3,161	-	-
44	OC-120	110	58	76	60	10,925	11 3/4		91	7,999	53	59	-	33	71 1/16	14	1,900	11,393	8,310	5,708	3,391	-	-
45	OC-15	128	67	90	74	16,000	12 1/4	Controlled D.H.E. Power Turn	114	12,734	70	85	-	35	87 3/4	16	2,800	15,300	10,000	6,700	4,000	-	-
46	OC-18	167	83	112	70	33,000	16 7/16		114	20,706	133	149	-	35	110 1/4	22	4,411	31,000	18,510	11,770	6,800	-	-

- (a) Includes transmission, steering cl., brakes
(b) Five-roller model: 35 shoes; towing radius, 70 in.; weight, 5,100 lb.; track length, 64 in.; ground contact, 1,329 sq. in.
(c) Manufacturer's rating
(d) Also available with electric motors
(e) Available with 4-cycle, 185-hp Cummins JF6 Diesel (31,120 - 69 in.; 51,630 - 74 in.; FOB Factory)
(f) Available with 4-cycle, 130-hp Cummins RT4 Diesel (32,480, FOB Factory)
(g) Available with 4-cycle, 165-hp Cummins RT4 Diesel (32,486, FOB Factory)
(h) Available with 4-cycle, 200-hp Cummins RT200 Diesel

- (i) Tires power units, liquid capacities for each engine
(j) Available as attachment in place of 2nd speed forward
(k) 7th gear: 6 mph, 8.777 DHP; 8th gear: 7.7 mph, 6.790 DHP
(l) Includes planet housing
(m) Shipping weight
(n) At track frame guide supports
(o) For spot-turn model, add \$30

Specs for Your Files...

Construction Methods AND EQUIPMENT

MAX. TRAVEL SPEEDS, MPH								ENGINE					BELT PULLEY			LIQUID CAPACITIES								
1st	2nd	3rd	4th	5th	6th	Reverse, Low	Reverse, High	Make	Model	Displacement cu. in.	HP at 1,000 RPM or Current Speed	Starting Method	Diameter, in.	Faces, in.	APV, in.	Cooling System, Gal.	Fuel Tank, Gal.	Oil, qt.	Transmission, qt.	Fuel Drive, qt.				
1.5	2.4	3.3	4	5.5	7.9	2	-	ALLIS-CHALMERS	HO-341	D 4 7/8 x 5 9/16 (4)	4 1,000	ELECTRIC	12	8 3/4	90	9	40	12	30	12	1			
1.4	2.1	2.9	3.8	4.4	5.7	1.6	4.4		HO-516	D 4 7/8 x 5 9/16 (4)	4 1,000		13 3/8	10	1,045	11	60	17	27	15	2			
1.4	2.1	3	3.9	4.5	5.8	1.5	4.5		10000	D 5 1/4 x 5 1/2 (4)	4 1,000		18	15	60	15	100	24	34	22	3			
0.25	0.43	0.72	-	-	-	0.32	0.55		10000	D 5 1/4 x 5 1/2 (4)	4 1,000		18	15	400-705	17	100	24	32	22	4			
0.3	0.48	-	-	-	-	0.40	-		23000	D 5 1/4 x 5 1/2 (4)	4 1,025		-	-	-	20	135	24	39	30	5			
1.7	2.7	4.5	-	-	-	2	-	Case	G-148	G 3 3/8 x 4 1/8 (4)	4 1,000	ELECTRIC	8 1/2	6 1/2	1,140	3	8	5 1/2	8	2 1/2	6			
0.18	0.29	0.48	-	-	-	0.21	-		FA-152	G 3 3/8 x 4 1/8 (4)	4 2,200		8 1/2	6 1/2	1,140	3 1/2	17	4	7 1/2	2 1/2	7			
0.18	0.29	0.48	-	-	-	0.21	-		GO-157	D 3 3/8 x 4 1/8 (4)	4 2,250		8 1/2	6 1/2	1,140	3 1/2	17	5	7 1/2	2 1/2	8			
0.157	0.222	0.340	0.456	-	-	0.180	0.730		F-209	G 3 3/8 x 4 1/8 (4)	4 2,250		-	-	-	4.75	25	5	28	4	9			
0.157	0.222	0.340	0.456	-	-	0.180	0.730		ED-280	D 3 1/8 x 4 1/8 (4)	4 2,250		-	-	-	4.75	25	11	28	4	10			
0.15	0.25	0.33	0.4	-	-	0.19	0.72	Case	HO-277	D 4 1/8 x 5 1/2 (4)	4 2,250	-	-	-	7 1/2	40	10	46	8	11				
0.15	0.25	0.33	0.4	-	-	0.19	0.72		JD-382	D 4 1/2 x 6 (4)	4 2,000	-	-	-	8 1/2	45	11	46	8	12				
1.5	2.7	3.4	4.2	6.1	-	2.2	-	CATERPILLAR	D-315	D 4 1/2 x 5 1/2 (4)	4 1,000	GASOLINE ENGINE WITH ELECTRIC STARTER	12	8 1/2	900	11	30	15	18	7	13			
1.7	2.6	3.6	5	6.6	-	2	6.2		D-318	D 4 1/2 x 5 1/2 (4)	4 1,000		11 5/8	13	1,040	14 1/2	46	22	42	13	14			
1.5	2.2	3.2	4.6	5.9	-	1.8	5.4		D-330	D 5 3/4 x 5 (4)	4 1,200		17 5/8	15	88	17	85	22	45	23	15			
1.5	1.9	2.7	3.5	4.6	6.3	1.5	6.4		D-342	D 5 3/4 x 5 (4)	4 1,200		14 1/8	15	1,015	27	134	30	136	36	16			
									D-342	D 5 3/4 x 5 (4)	4 1,200		14 1/8	15	1,015	27	134	30	120	36	17			
1.7	2.2	3	3.9	5	7	1.7	7		D-353C	D 6 1/4 x 8 (4)	4 1,240	-	-	-	35	157	36	52	54	18				
									D-353C	D 6 1/4 x 8 (4)	4 1,240	-	-	-	35	157	34	40	54	19				
1.14	2.23	2.90	3.67	7.34	-	1.05	-	Dress	430	G 4 1/4 x 4 (2)	4 1,000	Elec.	9	6	1,270	2 1/2	10 1/2	5	8	2 3/8	20			
1.02	1.65	2.91	3.78	5.23	-	1.70	-	Dress	440	G 4 1/4 x 4 (2)	4 2,000	Elec.	9	6	1,370	2 1/2	10 1/2	5	9	2 3/8	21			
1.04	1.66	2.95	3.82	5.30	-	1.76	-	GM	3-53	D 3 3/8 x 4 1/2 (2)	2 1,000	Elec.	9	6	1,270	2 1/2	10 1/2	5	9	2 3/8	22			
0.15	-	-	-	-	-	0.15	-	Elect	201	-	-	-	-	-	-	-	-	-	-	23				
0.20	0.10	0.45	0.45	Rev. 1 0.20	Rev. 2 0.13	Rev. 3 0.45	Rev. 4 0.45		GMC	4-53	D 3 3/8 x 4 1/2 (4)	2 2,000	Elec.	-	-	-	11	32	45	12	16	136	78	24
0.23	0.55	-	-	-	-	0.23	0.65		GMC	4080	D 4 1/4 x 5 (4)	2 2,000	Elec.	-	-	-	9	60	13	18	156	76	25	
0.25	0.60	-	-	-	-	0.25	0.60		GMC	4131	D 4 1/4 x 5 (4)	2 2,000	Elec.	-	-	-	10	60	13	18	156	76	26	
0.25	0.62	-	-	-	-	0.25	0.62		GMC	6771	D 4 1/4 x 5 (4)	2 2,100	Elec.	-	-	-	15	38	60	28	18	186	76	37
L-02, Int-04, HO-7.8								Same As Forward		GM 6-71	D 4 1/4 x 5 (4)	2 2,100	Elec.	-	-	-	38	100	46	200	36	28		
L-02.1, Int-04, HO-7.9								Same As Forward		GM 6-71	D 4 1/4 x 5 (4)	2 2,100	Elec.	-	-	-	39	118	25	140	16.5	29		
1.5	2.3	3.0	4.3	5.9	-	1.9	-	INTERNATIONAL	C-135	G 3 1/4 x 4 1/16 (4)	4 2,000	ELECTRIC	11	7 1/2	1,001	3 3/4	15	5	46	2	30			
1.6	2.3	3.2	4	5.7	-	1.8	3.7		D-281	G 4 1/8 x 5 1/4 (4)	4 1,500		12 1/8	8 1/2	811	10	33	9	18	1	31			
1.6	2.3	3.2	4.0	5.7	-	1.8	3.7		D-282	G 3 1/8 x 5 1/4 (4)	4 1,500		12 1/8	8 1/2	811	11	33	9	16	1	32			
1.7	2.5	3.4	4.4	6.0	-	2.0	-		D-282	G 3 1/8 x 5 1/4 (4)	4 1,700		11	8 1/2	970	12 1/2	33	9	22	1 1/2	33			
1.4	2.0	3.6	5.9	-	-	1.6	3.3		D-354	D 4 5/8 x 5 1/2 (4)	4 1,200		11 3/4	11	1,000	29	61	29	29	7 1/2	34			
1.5	1.9	2.8	3.3	4.3	5.8	1.8	7.1		D-401	D 4 3/4 x 5 1/2 (4)	4 1,200	11 3/4	11	990	24	35	26	42	10	35				
1.5	2.0	2.4	3.0	4.1	5.2	1.5	7.5		D-1001	D 5 3/4 x 7 (4)	4 1,300	-	-	-	43	135	30	192	21	36				
0.28	0.18	0.41	0.76	-	-	0.29	0.66		1001	D 5 3/4 x 7 (4)	4 1,300	-	-	-	47	135	30	192	21	37				
0.13	0.20	0.31	0.46	0.69	-	0.14	0.475	MM	256-K	G 3 5/8 x 5 (4)	4 1,900	Elec.	-	-	-	9 1/2	48	6	32	20	38			
1.56	2.37	3.36	5.27	-	-	1.81	-	Herc.	GO-130	G 3 1/2 x 4 1/2 (3)	4 1,700	8 1/2	6 1/2	1,038	3	11	5	8	3/4	39				
1.56	2.37	3.36	5.27	-	-	1.81	-	Herc.	DD-130	D 3 1/2 x 4 1/2 (3)	4 1,700	8 1/2	6 1/2	1,038	3	11	5	8	3/4	40				
1.8	2.4	3.2	4.1	5.1	8.8	1.9	3.3	Oliver	185-GLB	G 3 1/2 x 3 3/4 (4)	4 1,600	-	-	-	4 1/4	16 1/2	7	22	9	41				
1.8	2.4	3.2	4.1	5.1	8.8	1.9	3.3	Oliver	185-DAB	D 3 1/2 x 3 3/4 (4)	4 1,600	-	-	-	4 1/4	16 1/2	7	22	9	42				
1.6	2.3	3.3	5.2	-	-	1.7	3.6		DXLD	G 4 x 1 1/2 (4)	4 1,700	12	8 1/2	1,004	6	35	7	32	18	43				
1.6	2.3	3.3	5.2	-	-	1.7	3.6		DXDC	D 3 3/4 x 1 1/2 (4)	4 1,700	12	8 1/2	1,004	6	35	12	32	16	44				
1.6	2.5	3.7	5.6	-	-	1.9	4.4		DXDC	D 4 5/8 x 1 1/4 (4)	4 1,800	13	11	925	10 1/2	46	16	36	16	45				
1.5	2.6	3.7	5.4	-	-	1.8	3.5		DFXE	D 5 3/8 x 6 (4)	4 1,900	-	-	-	15 1/2	66	36	134	40	46				

Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.
J.I. Case Co., 200 State St., Racine, Wis.
Caterpillar Tractor Co., Peoria, Ill.
Deere & Co., Moline, Ill.
Eaton Corp., 5401 Lake City, Utah
Fendt Div., General Motors Corp., Cleveland 17, Ohio
International Harvester Co., 180 N. Michigan Ave., Chicago, Ill.
Manitowoc-Moline Co., Appleton, Wis.
Oliver Corp., 490 W. Madison St., Chicago, Ill.

About the Author
WILLIAM J. BYERS
 has been Assistant Service Manager in the Construction Machinery Division of Allis-Chalmers Mfg. Co. since 1949.



A veteran serviceman warns that good maintenance is essential for top performance.

MOTOR GRADERS



ADJUSTING—Keeping the circle and lift links in proper adjustment will eliminate loose fitting connections and assure instant moldboard response.



CHECKING—The precleaner and the air cleaner protect the engine from dust. It's a good idea to service them regularly, following closely the manufacturer's recommendations in the maintenance manual.

A WELL-PLANNED, carefully followed preventive maintenance program is essential to the efficient operation of a motor grader or, for that matter, any piece of construction equipment.

In the hands of a skilled operator, the motor grader is one of the most valuable tools available for both pioneering and finish work when grade control is of a major importance.

Knowing the grader, its capabilities and limitations is a "must" for the operator. He must be thoroughly familiar with the machine to get top performance from it.

But complete understanding and knowledge of the grader is only part of the job of getting top performance from the equipment. Thorough preventive maintenance is equally important.

Efficient operation is possible only when the machine is properly adjusted and lubricated. Failure to keep grader components properly adjusted and lubricated can affect the quality of the work it does.

Manufacturers have, through extensive trials and experiments,

established proven lubrication intervals, periodic adjustments, and operating procedures all directed at assuring efficient performance.

Guard Against Dust

Air cleaners and precleaners demand special attention. To protect the engine from dust, the air cleaner and precleaner must be serviced regularly, following the manufacturer's instructions.

All pipes and hoses between the air cleaner and engine must be inspected regularly to safeguard against leaks that would allow dirt-laden air to enter the engine. When operating under extremely dusty conditions, it may be a good idea in some cases to add an extension to the cleaner's inlet pipe. This will raise the air inlet out of the maximum dust zone.

Wintertime operation, including snow plowing, requires special air cleaner attention. Snow sometimes enters the cleaner with the air and melts inside. It must be removed from the bowl before it freezes or has a chance to raise the oil level.



LUBRICATING—Regular lubrication is basic in any good preventive maintenance program. Be sure to keep the lube fittings

clean. Wipe them each time before and after lubricating open type ball and socket joints, lift links, side shifts, and other joints.

If large amounts of moisture collect in the filtering portion of the air cleaner, the air flow will be restricted and the fuel-air ratio upset. A restricted air system usually can be detected by a loss of engine power and black smoke from the exhaust pipe.

Some operators stretch discarded nylon hose over the precleaner or air inlet to keep snow from entering the air cleaner. By striking the nylon with a stick periodically the accumulation of snow can be removed.

Fuel tank and fuel filters must be kept free of condensation in cold weather to protect the fuel system and assure easier engine starting. Periodic draining of fuel filter cans and sediment sump of the fuel tank will keep condensation to a minimum.

Every precaution should be taken to keep lube fittings clean. Wipe the fittings each time before and after lubricating open type ball and socket joints, lift links, side shifts, and other joints that require regular lubrication.

Because finish work is often the main duty of the motor grader, it is important to keep the circle

and lift links in proper adjustment. By holding loose fitting connections to a minimum, instant moldboard response is assured.

Proper tire inflation, based on manufacturer's specifications, is vital to extending tire life. And many hours of tire life can be added through tire rotation.

Proper use of leaning front wheels to counteract moldboard thrust will reduce wear and strain on front tires and will distribute stresses in front axle and frame properly.

Manufacturers have available companion or allied equipment that will add to the versatility of the basic unit and give the user more for his dollar. This optional equipment includes snow plows, dozer blades, loaders, shoulder maintainers, and many other attachments.

Rules for Safe Operation

Safety is always an important consideration. Here are rules for safe operation of the motor grader:

1. Never service a unit with the engine running.

2. Before leaving the operator's compartment, be sure the transmission is in neutral and the brakes are set.

3. When parking, be sure that the moldboard and any retractable (cable or hydraulically operated) equipment such as scarifier, snow plows, etc., are lowered to the ground.

4. Before starting the unit inspect the grader to be sure everything is in good order.

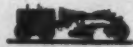
5. Before actual operation adjust the seat and become familiar with the controls. If the grader is new to the operator, he should work the controls to be sure of their operating action.

6. Before backing, under any condition, look behind to be sure the way is clear.

7. When operating downhill or on a side slope, keep the engine clutch engaged (except for shifting purposes) to control speed.

8. Anyone accompanying the operator while the motor grader is in operation should be seated in the operator's compartment.

MOTOR GRADERS



MAKE AND MODEL	WEIGHT			HP	DIMENSIONS, IN.										TRAVEL SPEEDS										ENGINE						
	Front Wheel	Rear Wheel	Total		Rating	Track Center	Length	Width	Height with Cab	Height with Cab	Wheel Base	Track, Front	Track, Rear	1st	2nd	3rd	4th	5th	6th	7th	8th	Reverse, Low	Reverse, High	Make	Model	Cyl. (Inch Stroke)	H.P. of Cylinders, In. & Stroke	Rated H.P.	Starting Method		
1 ALLIS-CHALMERS D	2,700	6,100	8,800	50	220	73	106	74	180	60	96 1/2	2.7	4.8	11.8	25.2	-	-	-	-	-	-	-	-	3.2	-	ALLIS-CHALMERS	205	6 4	4 1/2	1,600	ELECTRIC
2 50	2,700	6,500	9,200	50	224	73	106	74	180	60	96 1/2	2.6	4.7	11.6	25.2	-	-	-	-	-	-	-	-	3.2	-	AD-304	230	6 4	3 7/16 x 1 1/8	1,625	
3 145	6,800	15,000	21,800	80	304	92	126	90	225	79 1/2	78 1/2	2.7	4.8	6.0	8.4	12.2	20.3	-	-	-	-	-	-	3.2	7	AD-536	404	4	4 7/16 x 5 9/16	1,800	
4 45	6,625	17,375	24,000	127	300	92	126	100	225	79 1/2	78 1/2	2.7	4	5.0	8.7	12.9	20.6	-	-	-	-	-	-	3.2	7	AD-536	404	4	4 7/16 x 5 9/16	1,800	
5 AUSTIN-WESTERN Pacer 100	7,107	9,070	16,165	105	280	93	118	102	220	79	79	2.53	4.11	6.01	8.77	14.22	20.79	-	-	-	-	-	-	2.50	0.92	GMC	3-71	0 2	4 1/4 x 5	2,100	
6 Pacer 100 (T.C.)	7,130	9,260	16,400	105	280	93	118	102	220	79	79	2.53	4.11	6.01	8.77	14.22	20.79	-	-	-	-	-	-	2.50	0.92	GMC	3-71	0 2	4 1/4 x 5	2,100	
7 Super 100	7,110	11,527	18,642	105	303	96	118	102	220	84	84	2.53	4.11	6.01	8.77	14.22	20.79	-	-	-	-	-	-	2.50	0.92	GMC	3-71	0 2	4 1/4 x 5	2,100	
8 Super 100 (T.C.)	7,142	11,715	18,857	105	303	96	118	102	220	84	84	2.53	4.11	6.01	8.77	14.22	20.79	-	-	-	-	-	-	2.50	0.92	GMC	3-71	0 2	4 1/4 x 5	2,100	
9 Pacer 200	8,733	11,330	20,063	105	280	93	118	102	220	79	79	2.53	4.11	6.01	8.77	14.22	20.79	-	-	-	-	-	-	2.50	0.92	GMC	3-71	0 2	4 1/4 x 5	2,100	
10 Pacer 200 (T.C.)	8,700	11,510	20,270	105	280	93	118	102	220	79	79	2.53	4.11	6.01	8.77	14.22	20.79	-	-	-	-	-	-	2.50	0.92	GMC	3-71	0 2	4 1/4 x 5	2,100	
11 Super 200	7,998	12,495	20,494	105	303	96	118	102	220	84	84	2.53	4.11	6.01	8.77	14.22	20.79	-	-	-	-	-	-	2.50	0.92	GMC	3-71	0 2	4 1/4 x 5	2,100	
12 Super 200 (T.C.)	7,926	12,682	20,609	105	303	96	118	102	220	84	84	2.53	4.11	6.01	8.77	14.22	20.79	-	-	-	-	-	-	2.50	0.92	GMC	3-71	0 2	4 1/4 x 5	2,100	
13 Pacer 300	8,687	12,263	20,950	110	297	95	118	104	226	79	79	1.90	3.21	4.60	6.04	11.10	17.82	-	-	-	-	-	-	2.01	0.96	GMC	4-71	0 2	4 1/4 x 5	1,900	
14 Pacer 300 (T.C.)	8,712	12,453	21,165	122	297	95	122	104	226	79	79	1.90	3.21	4.60	6.04	11.10	17.82	-	-	-	-	-	-	2.01	0.96	GMC	4-71	0 2	4 1/4 x 5	2,000	
15 Super 300	8,747	14,101	22,849	133	315	96	124	104	236	82	82 3/8	1.90	3.21	4.60	6.04	11.10	17.82	-	-	-	-	-	-	2.01	0.96	GMC	4-71	0 2	4 1/4 x 5	1,900	
16 Super 300 (T.C.)	8,770	14,290	23,062	122	315	96	124	104	236	82	82 3/8	1.90	3.21	4.60	6.04	11.10	17.82	-	-	-	-	-	-	2.01	0.96	GMC	4-71	0 2	4 1/4 x 5	2,000	
17 CATERPILLAR 112	6,015	14,510	20,520	75	290	93	117	88	225	80	79	2.1	3	4	5.6	11.2	16	-	-	-	-	-	-	2.0	4	CAT	315	0 4	4 1/2 x 5 1/2	1,800	Elec.
18 12	6,380	16,080	22,460	115	302	93	118	88	225	80	79	2.3	3.6	5.5	8.5	12	18.3	-	-	-	-	-	-	4	6.3	CAT	310	0 4	4 1/2 x 5 1/2	1,800	Elec.
19 14	7,810	22,270	29,280	150	316	96	127	95	230	80	80	2.6	4.0	6.2	9.5	14.0	21.6	-	-	-	-	-	-	4.5	7.0	CAT	310	0 4	4 1/2 x 5 1/2	1,800	Elec.
20 GALLION 500	2,700	6,100	8,800	50	257	74	104	74	170	65	65	2.3	4.5	8.2	20.4	-	-	-	-	-	-	-	-	4.3	-	INC	UD-220	6 4	3 9/16 x 3 1/4	1,800	Direct Elec.
21 360	4,110	10,590	14,700	75	280	85	116	85	205	-	74	2.6	3.6	4.2	5.6	6.3	8.8	12	17	3.4	4.6	INC	UD-282	0 4	3 11/16 x 3 3/8	1,800					
22 400	6,200	14,600	20,800	85	305	94	126	92	227	80	80	2	3.3	5.2	7.1	11.8	20.1	-	-	-	-	-	-	2.4	8.4	INC	UD-370	0 4	4 5/8 x 5 1/2	1,800	
23 404	6,740	15,810	22,550	100	305	94	126	92	227	80	80	2	3.3	5.2	7.1	11.8	20.1	-	-	-	-	-	-	2.4	8.4	INC	UD-344	0 4	4 3/4 x 6 1/2	1,800	
24 410	6,910	16,000	22,910	125	300	95	127	93	227	80	80	2.5	4.2	6.4	8.8	14.8	22.6	-	-	-	-	-	-	2.9	10.5	INC	UD-354	0 4	4 5/8 x 5 1/2	1,800	
25 460	8,320	20,300	28,620	160	320	95	127	93	225	80	80	2.5	4.2	6.4	8.8	14.8	22.6	-	-	-	-	-	-	2.9	10.5	INC	H-60H	0 4	4 7/8 x 6	1,800	
26 Y100	7,312	16,320	23,632	125	310	95	127	93	231	80	80	2.3	3.6	5.5	8.5	12	18.3	-	-	-	-	-	-	Same as Forward	Cummins	JW6-B1	0 4	4 1/8 x 5	2,500	Direct Elec.	
27 Y100	8,320	20,300	28,620	150	320	95	127	93	225	80	80	2.3	3.6	5.5	8.5	12	18.3	-	-	-	-	-	-	Same as Forward	Cummins	J55	0 4	4 1/8 x 5	2,500	Elec.	
28 Y700	12,550	27,000	39,550	220	330	102	133	112	251	82	86	3-4.8	1.0-5.5	1.4-20	-	-	-	-	-	-	-	-	-	Same as Forward	Cummins	HC2200H	0 4	5 1/2 x 6	2,100	Direct Elec.	
29 RUBEN-BARCO M-52	2,120	4,130	6,250	45.5	163	86	100	70	114	60 1/2	60	2.6	4.6	8	16	20.7	-	-	-	-	-	-	-	4.2	-	Cont.	F-162	6 4	3 7/16 x 3 3/8	2,100	
30 40-75	6,580	15,190	21,750	75	300	96	128	100	220	80	81	2	3.5	5	6.8	8.2	11.1	16.322	2.3	5.1	5.1	INC	UD-370	0 4	4 5/8 x 5 1/2	1,800					
31 40-85	6,600	15,440	22,040	100	300	96	128	100	220	80	81	2.6	3.5	5	6.8	8.2	11.1	16.322	2.3	5.1	5.1	INC	3-71	0 2	4 1/2 x 5	2,000					
32 40-115	6,750	15,700	22,450	125	310	96	128	100	220	80	81	2.6	3.6	5	7	8.4	11.5	16.725	3.0	5.3	5.3	INC	4-71	0 2	4 1/4 x 5	1,800					
33 5-0	7,750	16,370	24,120	102	316	95	128	100	226	80	81	3.3	6.5	10.5	20.8	-	-	-	-	-	-	-	-	Same as Forward	GM	3-71	0 2	4 1/2 x 5	2,100		
34 6-02	7,820	16,580	24,400	125	318	95	128	100	226	80	81	3.5	7.1	11.5	23	-	-	-	-	-	-	-	-	Same as Forward	Cummins	JW60H	0 4	4 1/8 x 5	2,500		
35 7-0	8,600	18,460	27,060	140	318	96	129	110	226	80	81	3.3	6.5	10.5	20.8	-	-	-	-	-	-	-	-	Same as Forward	GM	4-71	0 2	4 1/2 x 5	2,100		
36 7-02	8,305	19,115	27,420	150	318	96	129	110	226	80	81	3.5	7.1	11.5	23	-	-	-	-	-	-	-	-	Same as Forward	Cummins	3015-400	0 4	4 1/8 x 5	2,500		
37 50-190	9,540	20,440	30,000	195	347	101	131	112	258	83	84	4.5	8.5	20	-	-	-	-	-	-	-	-	-	5.6	-	GM	6-71	0 2	4 1/2 x 5	1,800	
38 LETOURNEAU- WESTINGHOUSE 220	4,210	10,005	14,215	80	275	87	119	86	202	76	77	2.4	3.7	4.6	6.4	10.3	-	-	-	-	-	-	-	3.2	-	GM	4-51	0 2	4 1/2 x 4 1/2	1,400	
39 300	6,625	14,205	20,830	80	301	92	126	92	227	77	78	2.1	2.9	4.2	6	9.2	13	15	23.3	1.7	12.2	-	-	-	-	(a)	J-6-B1	0 4	4 1/8 x 5	1,800	
40 400	6,785	15,215	22,000	115	304	93	126	92	227	80	78	2.2	3.2	4.6	6.5	10	14.1	16.1	25.2	1.8	13.2	-	-	-	-	(b)	C-100-B1	0 4	4 7/16 x 5	1,800	
41 500	6,725	17,490	24,215	123	305	93	126	92	227	78	79	2.2	3.2	4.6	6.5	10	14.1	16.1	25.2	1.8	13.2	-	-	-	-	(b)	C-100-B1	0 4	4 7/16 x 5	1,800	
42 500 (Power Flow)	6,725	17,475	24,200	145	305	93	126	92	227	78	79																				

Specs for Your Files...

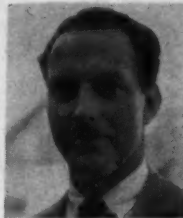
Construction Methods AND EQUIPMENT

BLADE										SCARIFIER				TIRES		CAPACITIES				MISCELLANEOUS						
Size, L. x W.	Max. Lift Above Ground, In.	Max. Blade Depth, In.	No. of Pitches Per Revolution	Max. Blade Cut Angle, Deg.	Max. Discharge Rate, In.	Type of Lifting Mechanism	Lift Speed, In. Per Sec.	Weight, Lb.	No. of Teeth	Space Between Teeth, In.	Max. Pressure, Lbs.	Front	Rear	Fuel Tank, Gal.	Cooling System, Gal.	Crank Case, Qts.	Transmission, Qts.	Control, Type	Steering, Type	Ground Clearance, In.	Width of Wheel Track, In.	Price, F.G.P. Factory, Standard Model				
10' x 15 1/2"	12	5 3/4	6	-	48 1/2	Hyd.	2.2	360	7	4 1/2	4,900	6.50-16	7.50-20	27	3	7	16	Hyd.	Manual	-	294	1	1			
10' x 15 1/2"	12	5 3/4	6	-	48 1/2	Hyd.	2.2	360	7	4 1/2	4,900	6.50-16	7.50-20	27	4	5	16	Hyd.	Manual	-	294	-	2			
12' x 22"	19 5/8	46 1/4	7	90	71 1/2	Mech.	2.12	1,500	11	4 1/2	9,400	9.00-24	13.00-24	63	7	12	8	Mech.	Manual	12 1/8	478	-	3			
12' x 22"	19 5/8	46 1/4	7	90	71 1/2	Mech.	2.12	1,500	11	4 1/2	9,400	9.00-24	13.00-24	63	9 1/2	14	8	Mech.	Hyd. Booster	12 1/8	440	-	4			
12' x 22 1/2"	15	82 1/2	7	90	99 1/2	HYDRAULIC	4.8	1,200	11	4 1/2	9,120	13.00-24	13.00-24	42	7 1/4	15	14	HYDRAULIC	ALL-WHEEL HYDRAULIC	14	304	-	5			
12' x 22 1/2"	15	82 1/2	7	90	99 1/2		4.8	1,200	11	4 1/2	9,150	13.00-24	13.00-24	42	7 1/4	15	14			14	304	-	6			
12' x 22 1/2"	15	82 1/2	7	90	99 1/2		4.8	1,200	11	4 1/2	9,140	12.00-24	12.00-24	42	7 1/4	15	14			14	304	-	7			
12' x 22 1/2"	15	82 1/2	7	90	99 1/2		4.8	1,200	11	4 1/2	9,170	12.00-24	12.00-24	42	7 1/4	15	14			14	304	-	8			
12' x 22 1/2"	15	82 1/2	7	90	99 1/2		4.8	1,200	11	4 1/2	9,400	13.00-24	13.00-24	42	7 1/4	15	14			14	304	-	9			
12' x 22 1/2"	15	82 1/2	7	90	99 1/2		4.8	1,200	11	4 1/2	9,710	13.00-24	13.00-24	42	7 1/4	15	14			14	304	-	10			
12' x 22 1/2"	15	82 1/2	7	90	99 1/2		4.8	1,200	11	4 1/2	10,360	12.00-24	12.00-24	42	7 1/4	15	14			14	304	-	11			
12' x 22 1/2"	15	82 1/2	7	90	99 1/2		4.8	1,200	11	4 1/2	10,380	12.00-24	12.00-24	42	7 1/4	15	14			14	304	-	12			
12' x 24"	16	97	7	90	129		4.8	1,200	11	4 1/2	11,100	14.00-20	14.00-20	53	9	17	14			15	304	-	13			
12' x 24"	16	97	7	90	129		4.8	1,200	11	4 1/2	11,150	14.00-20	14.00-20	53	9	17	14			15	304	-	14			
12' x 24"	16	97	7	90	129		4.8	1,200	11	4 1/2	11,200	13.00-24	13.00-24	53	9	17	14			15	414	-	15			
12' x 24"	16	97	7	90	129		4.8	1,200	11	4 1/2	11,200	13.00-24	13.00-24	53	9	17	14			15	414	-	16			
12' x 24"	16	96	17	90	77	WORM GEAR	3	1,511	17	4 3/8	8,910	7.50-25	13.00-24	60	11	18	56	Mach. (Power) Mech.	Manual (Booster)	18	428	-	17			
12' x 24"	16	96	15	90	68		3	1,511	17	4 3/8	8,850	9.00-25	13.00-24	60	14 1/2	26	50			20	428	-	18			
12' x 27"	17 1/4	103 3/4	15	90	88		3 3/4	1,400	11	4 1/2	9,325	14.00-24	14.00-24	60	18 3/4	29	54			22 3/4	432	-	19			
10' x 16 5/8"	12	6	6	-	-	HYDRAULIC	3	600	7	5	3,775	7.50-20	7.50-20	23	4 1/2	8	16	HYDRAULIC	Manual	21	372	-	20			
10' x 20"	15 1/2	31	8	90	61		3	750	9	5	5,175	10.00-24	10.00-24	23	5 1/4	9	48			19	396	-	21			
12' x 24 1/2"	18 1/2	44	8	90	72		3	1,350	11	4 1/2	7,525	13.00-24	13.00-24	70	13	11	45			21	400	-	22			
12' x 24 1/2"	18 1/2	44	8	90	72		3	1,350	11	4 1/2	8,700	13.00-24	13.00-24	70	15	16	45			21	400	-	23			
12' x 24 1/2"	19 1/2	44	8	90	78		3	1,350	11	4 1/2	9,575	13.00-24	13.00-24	70	21	20	45			22	400	-	24			
12' x 25"	19 1/2	100	8	90	103		3	1,500	11	4 1/2	11,500	14.00-24	14.00-24	70	15	-	45			22	400	-	25			
12' x 24 1/2"	19 1/2	100	8	90	103		3	1,350	11	4 1/2	9,750	14.00-24	14.00-24	75	34 3/4	20	34			22	400	-	26			
12' x 25"	19 1/2	100	8	90	103		3	1,500	11	4 1/2	11,500	14.00-24	14.00-24	80	11	20	47			22	400	-	27			
14' x 30"	19 1/4	100	8	90	103		3	2,150	9	5 5/8	16,500	16.00-24	16.00-24	90	15	29	44			30	400	-	28			
9' x 13 1/2"	9	19 1/4	3	-	39	HYDRAULIC	3	275	5	8	2,400	7.50-16	12.00-20	17	3	4	4 1/2	HYDRAULIC	Manual	14	210	-	29			
12' x 24"	16	6	90	72	72		3	1,400	11	4 1/2	8,750	13.00-24	13.00-24	54	13	11	48			29	400	-	30			
12' x 24"	16	6	90	72	72		3	1,400	11	4 1/2	8,700	13.00-24	13.00-24	54	6 1/2	15	48			29	400	-	31			
12' x 24"	16	6	90	72	72		3	1,400	11	4 1/2	8,800	13.00-24	13.00-24	54	7 1/2	22	48			29	400	-	32			
12' x 24"	16	6	90	72	72		3	1,400	11	4 1/2	10,740	13.00-24	13.00-24	54	6 1/2	15	28			29	400	-	33			
12' x 24"	16	6	90	72	72		3	1,400	11	4 1/2	10,300	13.00-24	13.00-24	54	11 1/2	16	28			29	400	-	34			
12' x 25"	17	6	90	78	78		3	1,550	11	4 1/2	11,000	14.00-24	14.00-24	57	7 1/2	22	28			30	522	-	35			
12' x 26"	17	6	90	78	78		3	1,550	11	4 1/2	11,500	14.00-24	14.00-24	57	11 1/2	16	28			30	522	-	36			
12' x 28"	17	6	90	78	78		3	1,550	11	4 1/2	13,300	16.00-24	16.00-24	57	9 1/2	24	58			32	540	-	37			
10' x 20"	17	32 1/2	6	90	54 1/4	WORM GEAR	2.9	625	9	5	5,480	10.00-24	10.00-24	25	4	12	60 1/2	Hyd.	Manual	19	420	10,175	38			
12' x 25"	17 1/4	11	90	100	100		2.7	1,315	11	4 1/2	8,620	7.50-20	12.00-24	54	13	11	63			Mech. (Manual)	23	480	15,544	39		
12' x 25"	18 1/4	11	90	100	100		2.7	1,315	11	4 1/2	8,500	9.00-24	13.00-24	52	13	16	63			Mech. (Manual)	25	480	16,594	40		
12' x 25"	18 1/4	11	90	100	100		2.7	1,490	11	4 1/2	9,000	3.00-24	31.00-24	60	13	16	63			Mech. (Manual)	25	480	18,140	41		
12' x 25"	18	11	90	100	100		2.7	1,490	11	4 1/2	9,000	9.00-24	13.00-24	60	21	24	62 (4)			Mech. (Mach.)	25	480	19,586	42		
12' x 28"	18 3/4	11	90	100	100		2.7	1,745	9	5 5/8	9,500	14.00-24	14.00-24	85	20	24	63			Mech. (Hyd.)	28	480	21,546	43		
12' x 28"	18 3/4	11	90	100	100	HYDRAULIC	2.7	1,745	9	5 5/8	9,500	14.00-24	14.00-24	85	20 1/2	24	62 (4)	Hyd.	Manual	28	480	24,520	44			
12' x 24"	17 1/2	48	15	90	81			2,100	11	4 1/2	14,200	14.00-24	14.00-24	60	10 1/2	15	40			Hyd. (Com. Man. & Hyd.)	21 1/2	300	-	45		
12' x 24"	17 1/2	48	15	90	81			2,100	11	4 1/2	10,000	14.00-24	14.00-24	60	10 1/2	15	40			Hyd. (Com. Man. & Hyd.)	28	456	-	46		
12' x 24"	17 1/2	48	15	90	81			2,100	11	4 1/2	14,200	14.00-24	14.00-24	60	10 1/2	15	40			Hyd. (Com. Man. & Hyd.)	21 1/2	456	-	47		
12' x 24"	18	40	15	90	85			1,410	11	4 1/2	7,700	12.00-24	12.00-24	45	9 1/2	12	46			Hyd. (Com. Man. & Hyd.)	23"	480	-	48		
12' x 24"	18	40	15	90	85			1,410	11	4 1/2	8,450	12.00-24	12.00-24	45	10 1/2	13	46			Hyd. (Com. Man. & Hyd.)	23	480	-	49		
12' x 24"	18	40	15	90	85			1,410	11	4 1/2	9,025	13.00-24	13.00-24	45	10 1/2	15	46			Hyd. (Com. Man. & Hyd.)	23 1/4	480	-	50		
12' x 24"	18	40	15	90	85			1,410	11	4 1/2	9,875	13.00-24	13.00-24	45	10 1/2	15	46			Hyd. (Com. Man. & Hyd.)	23 1/4	480	-	51		
12' x 24"	18	40	15	90	85			1,410	11	4 1/2	9,950	14.00-24	14.00-24	45	10 1/2	15	46			Hyd. (Com. Man. & Hyd.)	24	480	-	52		

Adams Div., Lo-Torque-Westinghouse Co., Peoria, Ill.
 Alco-Chalmers Mfg. Co., Milwaukee, Wis.
 Austin-Western Works, 651 E. Farmstead, Aurora, Ill.
 Caterpillar Tractor Co., Peoria, Ill.
 Gulton Iron Works & Mfg. Co., Gulton, O.
 Huber-Warco Co., Marion, O.
 Pettibone-Wedding Corp., 4,700 W. Division St., Chicago, Ill.

About the Author

DON O'ROURKE is supervisor of the LeTourneau-Westinghouse operator and maintenance manuals. He has been with the company's technical publications section for 11 years.



An observant operator, says this expert, can spot potential trouble even before it starts.

SCRAPERS

THE DEMAND TODAY is for more speed in every type of mechanized equipment. In the earthmoving industry, one of the answers to this need is the high speed, rubber-tired, self-propelled scraper. While we have taken great strides in the improvement of this type of equipment, in many cases our maintenance and servicing of these machines is antiquated.

Fine engineering and manufacturing may produce machines that can handle the most rugged jobs, but to keep these rigs working, a thorough preventive maintenance program must be initiated and carried out.

By specifying a preventive maintenance program, we mean exactly that. Prevent the need for costly repairs. Prevent the need for deadlining a piece of expensive equipment for a long period of time due to someone's neglect and abuse.

One way to do this is for the operator to spend a few minutes at the end of each day's operation making a visual inspection of his machine to determine if any adjustments or repairs are necessary before placing the machine back into operation the following day. A full report should be made to the person in charge of maintenance so that the needed repairs will be made.

Visual Inspection

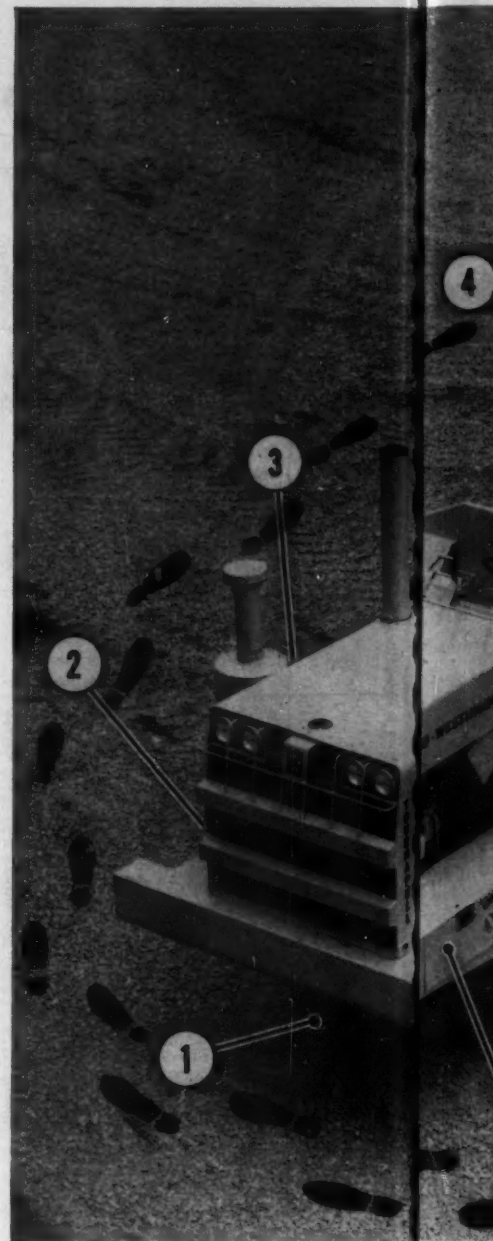
To give an example of this visual inspection, let's take the LeTourneau-Westinghouse Model B Tournapull and Scraper and go

through the step by step routine. Making this type of inspection involves little more than taking a walk. So start at the front of the machine and walk around it.

1. First, bend down and take a look under the front of the 'Pull. Are there evidences of leakage from the radiator or hoses? A spongy feel to the hoses indicates a breakdown of interior hose walls. Be sure both upper and lower hose clamps are tight. Check to see if the drain cock is completely closed. The radiator cores must be free of debris, or overheating of the engine will result. 2. Take a moment to check the fan, water pump, and compressor drive belts. They must be tight enough to avoid slipping but not tight enough to cause accelerated wear of the pulleys, bearings, or belts. If the belts are worn to the point where they may break at any time, don't put off replacing them. Take a few minutes to do it right now—chances are it will save you time in the long run.

3. Listen for air leaks at the compressor and the line fittings. If the compressor can't maintain the specified amount of air in the system for satisfactory operation of the brakes, it may be due to loose connections or crimps and breaks in the lines.

4. Electrical connections at the terminal strips of the electric motors and main switches must be tight. If there are worn spots on any of the wiring, they should be taped. A loose or lost cable clamp may seem insignificant at the time but it could result in shorts or

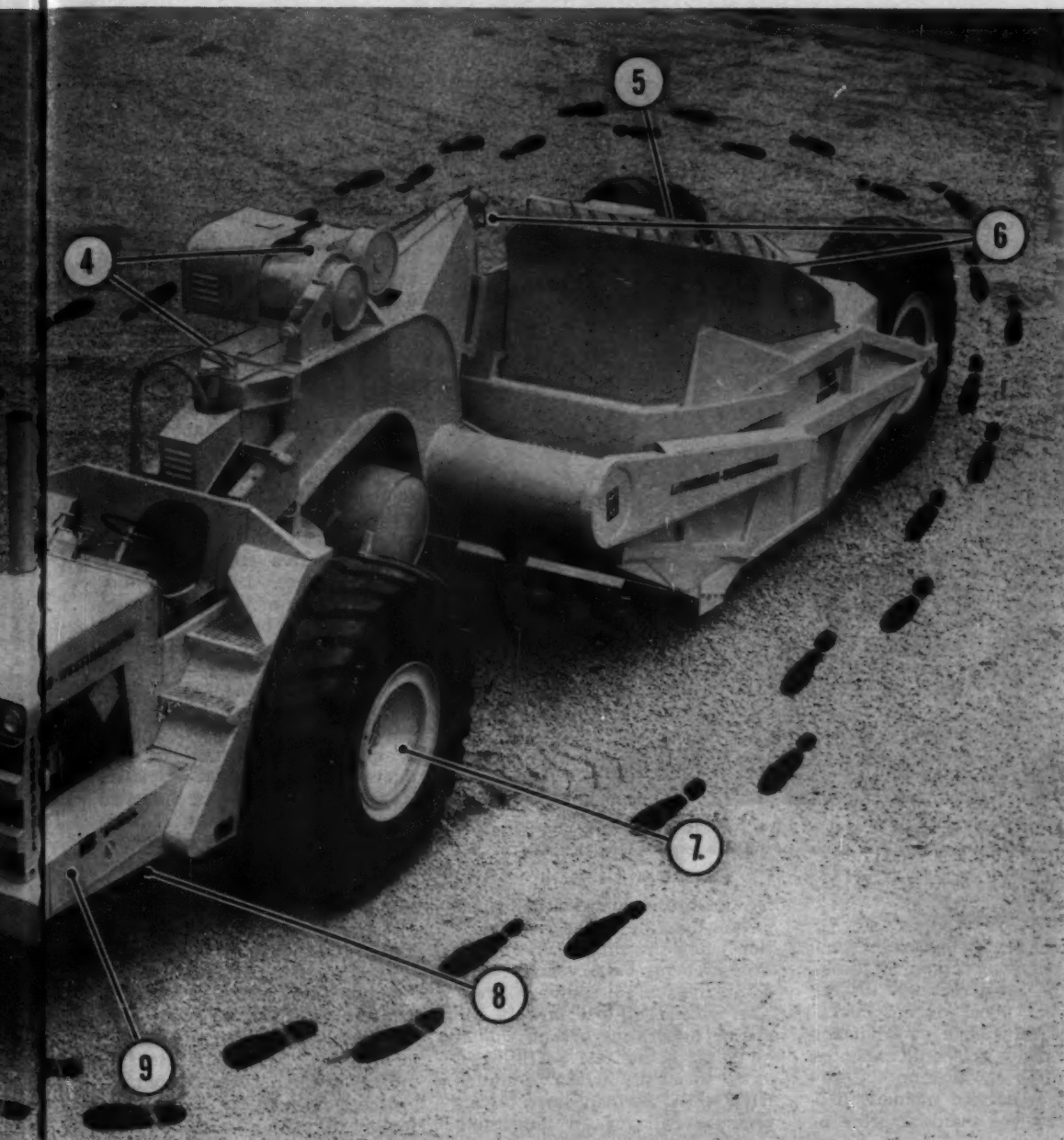


DAILY CHECK—simply by walking around his machine at the end of the day, an op-

opens occurring in the system due to excessive flexing of wires and cables or constant rubbing against a moving part.

5. Cable sheaves and rollers must turn freely and be kept free of dirt and rocks. If the cable is becoming frayed, make advance arrangements to have it changed at such a time that deadlining of the machine won't be necessary. Don't wait for it to break before changing it.

6. The travel distance of the mov-



erator can spot little troubles before they get big. A look under the front of the scraper (1) reveals oil or water leaks. Battery check (9) insures a good start next morning.

ing parts on the scraper is limited by switches inserted into the electrical system. This avoids cable breakage and damage to parts due to over-travel. To insure proper function of these switches the actuating levers must be kept free of obstacles such as dirt and debris. Be sure lead wires have not been broken or pulled free of the switch.

7. Examine the tires for cuts that would permit foreign particles to work their way into the body

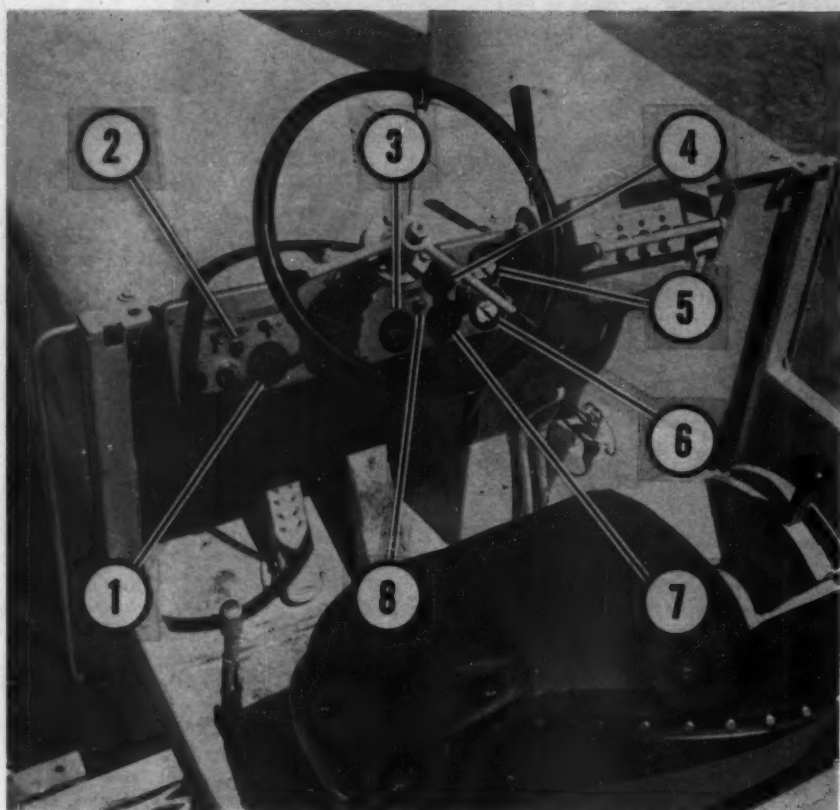
plies, damaging the tire beyond repair. Improper inflation will cause undue wear and break down of the sidewalls. A worn tire, if removed in time can be recapped, eliminating the expense of buying a new tire. While looking at the tires, at the same time determine if wheel bolts are tight.

8. While making the above checks, look for oil leaks around drain plugs and oil line connections. Keep a close check on the oil level in the engine crankcase if there

are signs of oil leakage in the bottom of the case.

9. To assure getting off to a good start each morning, check the batteries frequently to determine if they require water and are blocked in securely to prevent damage to them. If you have to add water, do it just prior to placing the machine in operation. This assures a good mixture of electrolyte and water; it also prevents freezing.

continued on next page



INSTRUMENT PANEL—Gages in front of driver continually inform him of machine performance. Simple to read, they alert a smart operator to correct potential trouble.

Instrument Panel

A further check on certain components of your scraper is to observe the gage readings on the instrument panel during operation. A knowledge of what the correct readings should be must be acquired by reading the operator's or service manuals furnished by the manufacturers of your equipment. Listed below with a brief description of their function, are the gages found on the instrument panel of the Model B Tournapull equipped with an Allison Torqmatic Transmission.

1. Ammeter—This gage indicates the rate of charge or discharge of the batteries. With the engine at high idle and no load placed upon the electrical system, a charge rate should be indicated on the gage. If there is a constant discharge shown, the cause should be investigated and corrected before the batteries become completely drained.

2. D. C. Main Switch Warning Light—This light serves as a re-

minder to the operator that main switch must be in the "off" position when shutting down engine. This prevents battery drain.

3. Engine Oil Pressure Gage—The normal oil pressure in the engine lubricating system should be 25 psi in the GM 6-110 diesel or 30 to 50 psi in the Cummins NRTO-6BI. Sudden drops in this pressure call for an immediate shut down of the engine. Extensive damage could be caused to the engine if it is operated with inadequate pressure in the lubricating system.

4. Temperature Gage—A reading of 160 to 185 deg is normal. Temperatures in excess of this indicate that the proper cooling action is not taking place. This could be due to blocked radiator cores, insufficient coolant in the radiator, fan belts loose or broken, faulty thermostats, or improper function of the water pump. In all likelihood, corrective action taken as soon as this high temperature is noted, will prevent costly damage.

5. Transmission Oil Pressure Gage. The multiple range clutches in the transmission are hydraulically applied. A pressure of 100 to 225 psi must be maintained for normal application of these clutches. Inadequate pressures will result in faulty operation of the unit and should be corrected at once.

6. Transmission Temperature Gage—This gage indicates the temperature of the oil as it leaves the torque converter. Temperatures of 150 to 250 deg indicate satisfactory performance. If temperature should rise above this, shift into neutral and run the engine at 1000 to 1200 rpm. A rapid temperature drop in 2 or 3 min should take place. If this fails to take place, trouble is indicated, and corrective steps should be taken at once. Discoloration or a strong odor of the oil indicates that it is being burned and should be changed before proceeding with operations.

7. Air Pressure Gage—The proper function of the wheel brakes depends on the ability of the air compressor to maintain an adequate supply of air in the system. At least 90 lb should be indicated on the gage at all times. If pressure can not be built up to this point, there may be a loose drive belt, loose connections in the lines, crimped lines, or a faulty compressor. Check the governor to determine if it is adjusted properly. Before doing this refer to maintenance manual.

8. Steering Motor Warning Light—Normally this light remains on at all times. Should the steering motor become over-heated, a switch located on the stator of the motor will open, causing the light to go off. Allow the motor a short time to cool and the light to come back on. If the light persists in going off, the cause should be investigated and corrected before damage is caused to the motor.

The gages on the instrument panel have been put there to warn the operator of trouble. Too often these warnings are ignored, and serious damage is caused to an expensive piece of equipment. The capabilities of an operator are reflected in the appearance and condition of his machine. A preventive maintenance program may be initiated by the contractor, but it is up to the operator to see that it is carried out successfully.

Specs for Your Files...

TRACTOR-DRAWN SCRAPERS

Construction Methods AND EQUIPMENT



MAKE AND MODEL		GENERAL DATA						PERFORMANCE DATA										DIMENSIONS, OVERALL													
		Recommended Tractor Drawn	Stock Capacity, Yds.	Heaped Capacity, Yds.	Capacity, Tons	Cable, Type	Ejection, Type	Price, FOB, Factory	Width of Cut, In.	Depth of Cut, In.	Depth of Spread, In.	Apron Opening, In.	Width of Scraping Turn, In.	Weight Distribution		Length, In.	Width, In.	Height, In., Blade on Ground	Bottom Dimensions, In.	Height of Stack, In.	Wheel Base, In.	Standard Tires, Front	Standard Tires, Rear	Gears, Front	Gears, Rear	Weight, Shipping					
														\$ on Front Wheel, Empty	\$ on Front Wheel, Full																
1	ALLIS-CHALMERS 44		4	5.5	6.5	Hyd.	POSITIVE FORCED	\$ 4,896	76	7.5	12.6	71	237	45	55	45	55	280	93	66	28 1/2 x 7 1/2	35	166.5	11.00-20	11.00-20	59	61	6,995	1		
2	106		6.1	8.5	10	Cable		7,362	99	9	17	70	243	45	55	45	55	300	118	73 1/2	35 x 93	38	168	14.00-20	14.00-20	53	77	10,300	2		
3	108		8.4	12	14	Cable		10,012	102	10	18	87 1/2	291	45	55	45	55	334	124	96 1/2	42 x 102	42	195	16.00-20	16.00-20	60	84	15,250	3		
4	315		15	20	25	Cable		15,169	116	10	20	102	337	45	55	45	55	406	138	118 1/2	49 x 116	62	232.5	21.00-24	21.00-24	75	88	25,850	4		
5	ALLIED KS-700	65-85	7	9		Cable	POSITIVE		84	12	15	45	216					306	102	30	43 x 94	45	204	16.00-20	16.00-20	63	63	16,040	5		
6	KS-800	85-115	8.2	11		Cable			102	12	20	55	228					384	128	104	48 x 102	40	220	16.00-24	16.00-24	80	80	19,560	6		
7	KS-1000	100-135	10	13		Cable			102	12	20	55	228					384	128	104	48 x 102	50	220	16.00-24	16.00-24	80	80	20,650	7		
8	KS-1500	135-170	15	19		Cable			120	12	24	59	300					464	142	110	77 x 120	50	280	21.00-24	21.00-24	93	93	33,100	8		
9	KS-1700	135-170	17	21		Cable			120	12	24	59	300					464	142	110	77 x 120	57 1/2	280	21.00-24	21.00-24	93	93	34,100	9		
10	ATECO H-61	25-50	4.4	6	6.6		POSITIVE ROLL OUT	4,550	84	6	14	40	234	45	55	42	58	262	90	76	32 x 84	38	158	6.5-20	6.5-20	52	72	7,200	10		
11	H-65	30-50	5.2	7	7.7			4,754	84	6	14	40	234	45	55	42	58	262	90	76	32 x 84	43	158	6.5-20	7.5-20	52	72	7,500	11		
12	H-80	50-70	8.25	11	12.1	HYDRAULIC		7,290	100	6	14	44	252	42	58	40	60	300	112	84	44 x 103	43	192	16.00-20	16.00-20	62	86	12,270	12		
13	H-90	50-90	8	10	11			7,395	103	6	14	44	252	42	58	40	60	300	112	84	44 x 103	49	192	16.00-20	16.00-20	62	86	12,520	13		
14	BE-GE ST-750	40-60	4.2	5.6	6.5		FORCED ROLL OUT	5,407	84	15	13	42.5	228	48	52	48	52	269	102	73	36 x 84	38	157	11.00-20	11.00-20	46 1/2	71 1/2	8,300	14		
15	ST-767	40-60	5.3	6.7	7.6			5,547	84	15	13	42.5	228	47	53	47	53	269	102	73	36 x 84	48	157	11.00-20	11.00-20	46 1/2	71 1/2	8,500	15		
16	ST-850	50-70	6.7	9	10.3	HYDRAULIC		7,491	102	13	14	52	262	40	52	48	52	319	122	74	42 x 102	43	188	14.00-20	14.00-20	58	83	12,600	16		
17	ST-85105	50-70	8.2	10.5	12			7,993	102	13	14	52	262	47	53	47	53	319	122	74	42 x 102	49	188	14.00-20	16.00-20	58	83	13,000	17		
18	ST-85120	60-95	8.5	11.7	13.4			9,504	102	11	16	58	286	48	52	48	52	354	123	86	48 x 102	46	213 1/2	16.00-25	16.00-25	66	80	15,900	18		
19	ST-85140	60-95	10.5	14	16.1			10,070	102	11	16	58	286	47	53	47	53	354	123	86	48 x 102	58	213 1/2	16.00-25	18.00-25	66	80	16,500	19		
20	CATERPILLAR 60	75	7	9	11.5		DOZER TYPE, POSITIVE		96.8	11	25.5	54	264	45	55	40	60	338	112	93	40 x 92	47	201.8	14.00-21	16.00-21	62	71	13,500	20		
21	435	75-180	15	19	22.5			112	18.5	64	300	42	58	40	60	400	130	119	51 1/2 x 108	64	240.8	20.5-25	20.5-25	68	76	25,400	21				
22	463	180-260	22	29	33			124	20	72	348	42	58	41	59	456	141	134	69 x 129	62	277.5	26.5-25	26.5-25	77	87	34,800	22				
23	491	180-260	27	34	41			124.5	16	86	394	43	57	40	60	478	144	155	65 x 129	66	303.7	24.00-29	27.00-31	81	86	37,400	23				
24	CURTIS-WRIGHT CWT-8	75	8	10.5	13.5		POSITIVE ROLL OUT	8,750	92	16	60	294	47	53	44	56	339	110	94		47	200	16.00-20	16.00-20	60	72	15,300	24			
25	CWT-10	100	10	13.5	18			11,250	102	21	60	302	47	53	46	54	360	121	102		48	217	18.00-25	18.00-25	68	81	20,100	25			
26	CWT-15	150	15	20	21			15,750	120	24	70	357	47	53	45	55	408	143	121		61	249	23.5-25	26.5-25	70	92	29,800	26			
27	CWT-20	155+	20	27	28			20,475	120	22.5	79	378	47	53	45	55	435	143	121		65	268	26.5-25	29.5-25	80	92	39,900	27			
28	CWT-25	190+	26	33	36.5			28,125	129	25.5	112	424	47	53	45	55	470	143	147		75	299	29.5-29	29.5-29	80	91	51,000	28			
29	CWT-30	200+	30	39	42			33,225	120	28	110	433	47	53	45	55	490	144	146		76	315	29.5-29	33.5-31	80	91	55,400	29			
30	INTERNATIONAL 45-55	101-125	10.3	14	18.8		Positive Roll Out	11,530	108	Not Limited	31	73	300					388	131	102	58 x 108	49	224	16.00-25	21.00-25	67 1/2	86	24,550	30		
31	45-65	126-175	16	20	27.5			17,000	114		37	82.3	396					434	138	117	72 7/8 x 114	66	266	21.00-25	24.00-29	78	90.8	34,425	31		
32	LE TOURNEAU-WESTINGHOUSE BT	150+ C-Tours Tractor only	21	28	32.5	Cable	Pos. and	22,280	120	20	70	80	442	49	51	43	57	482	140	128	60 x 129	63	311	29.5-29	29.5-29	96	94	39,800	32		
33	CE		12.2	18	20	Cable		16,485	114	16	73	312	-	-	-	-	399	136	116	60 x 114	47	311	16.00-20	21.00-25	66	82	26,300	33			
34	CLE		19.2	27	20	Cable			120	18	79	411	-	-	-	-	453	140	128	60 x 120	63	288	23.5-25	24.00-25	82	96	32,600	34			
35	CT	90+	12.2	18	20	Cable	POSITIVE FWD.	13,713	114	24	20	72	378	47	53	43	57	402	136	126	59 x 114	47	253	18.00-25	26.5-25	83	83	25,100	35		
36	DT	70+	8.3	11.5	14	Cable		9,870	180	24	20	60	310	45	55	46	54	347	123	100	40 x 102	45	281	16.00-20	16.00-20	66	80	15,750	36		
37	OLIVER ST-530	25-30	2.5	3.0		Pully Hyd.			60	7 1/2	8	36	186					232	72	59		32	137	7.50-20	7.50-20			4,595	37		
38	ST-645	35-40	3.6	4.5					72	8	11	40	207					44	56	259	84	64		36	153	9.00-20	9.00-20			6,080	38
39	ST-770	40-50	5.05	7.0					84	12 1/2	11	42	220					44	56	277	100	71		40	168	11.00-20	11.00-20			7,900	39
40	ST-8690	50-70	6.75	9.0					102	13	14	52	261					44	56	319	121	76		43	180	14.00-20	14.00-20			12,360	40
41	ST-85105	50-70	8.25	10.5					102	13	14	52	261					44	56	319	121	76		49	180	14.00-20	16.00-20			12,710	41
42	ST-85120	60-95	8.5	12.0					102	11	16	58	285					44	56	353	123	86		46	204	16.00-24	16.00-24			15,900	42
43	ST-85140	60-95	10.5	14.0					102	11	16	58	285					44	56	353	123	86		58	204	16.00-24	18.00-24			16,325	43

Allis-Chalmers Mfg. Co., Tractor Div., Box 512, Milwaukee, Wis.
 Allied Tractor Equip. Co., 2917 E. Marginal Way, Seattle 4, Wash.
 American Tractor Equipment Co., San Leandro Blvd., Oakland, Calif.
 Be-Ge Mfg. Co., Gilroy, Calif.
 Caterpillar Tractor Co., Peoria, Ill.

Curtis-Wright Corporation, South Bend Division, South Bend, Indiana
 International Harvester Co., 100 N. Michigan Ave., Chicago, Ill.
 LeTourneau-Westinghouse Co., Peoria, Ill.
 Oliver Corp., 15300 Euclid Ave., Cleveland 17, Ohio

SELF-PROPELLED SCRAPERS



MAKE AND MODEL		GENERAL						PRIME MOVER																						
		Shed Capacity, Yds.	Heaped Capacity, Yds.	Tons, Capacity	Width of Run-Up Turn, In.	Scraper Control, Type	Price, Standard, FOB, Factory	Engine, Make & Model	Rated Horsepower	Rated RPM	No. of Cylinders	Piston displacement, cu. in.	MAXIMUM TRAVEL SPEEDS						Starting Method	Drum, Sq. In. of Contact	Clutch Size, In.	Oil in Crankcase, Qts.	Cooling System Capacity, Qts.	Fuel Tank Capacity, Gal.						
													1st	2nd	3rd	4th	5th	Reverse												
1	ALLIS-CHALMERS TS-360	7	9.5	12	297	Cable Hyd Cable	27,990	TDS-516	155	2,200	6	516	3.1	5.0	8.5	13.2	25.4	3.1	ELECTRIC	435	13	17	54	84						
2	TS-260	11	14	18	371		39,695	A-C-16,000	230	2,000	6	844.3	2.7	5.3	10.2	17.7	27.9	3.5		615	17	32	60	100						
3	TS-360	15	20	25	532		44,680	AC-TDS-944	200	2,100	6	844	3	6.1	11.3	20	-	3.1		700	17	32	62	135						
4	CATERPILLAR *No. 428 (DW15 Tractor)	13	18	18.5	420	CABLE		CAT D326-F	200	2,000	6	805	2.7	6.2	11.4	18.1	29.1	4.1	GAS OR ELECTRIC	628	16	33	80	75						
5	No. 442 (No. 613 Tractor)	14	18	21	360			CAT D326-H	225	2,000	6	805	3.0	6.1	9.1	13.9	19.9 ^(a)	3.5		628	16	33	80	85						
6	No. 456 (DW20 Tractor)	19.5	27	29.25	456			CAT D337-H	345	2,000	6	805	3.2	6.1	10.0	17.0	27.9	4.1		668	16	33	90	90						
7	No. 470 (DW21 Tractor)	19.5	27	29.25	432			CAT D337-H	345	2,000	6	805	2.6	5.0	8.1	13.8	22.6	3.3		668	16	33	90	100						
8	*No. 482 (DW20 Tractor)	24	34	36.0	456			CAT D337-H	345	2,000	6	805	3.2	6.1	10.0	17.0	27.9	4.1		668	16	33	90	90						
9	MICHIGAN (Clark Equip. Co.) 110	8	10.5	13	340	HYDRAULIC		Cummins JT-6-B1	162	2,300	6	401	4.5	8.6	16.4	31.4	(TC)	Same as Forward	ELECTRIC	744	-	16	40	65						
10	210	13.5	19	22.5	402			Cummins NTO-6-B1	262	2,100	6	743	4.5	8.6	16.4	31.4	(TC)	Same as Forward		1,120	-	36	52	110						
11	310	21.6	29	35	467			Cummins NFT-6-B1	375	2,300	6	743	3.9	8.3	15	31.2	(TC)	Same as Forward		1,876	-	36	68	160						
12	CURTIS-WRIGHT CW-27	7.0	10	13	318	CABLE	26,295	GM 4-71	143	2,100	4	284	2.9	5.6	10.9	19	25.3	2.9	ELECTRIC	960	13	12	28	55						
13	CW-215	15	21	21	397		41,780	Cummins HRS-6	240	1,800	6	743	3.0	5.1	8.7	15.1	23.8	4.0		1,240	17	27	44	76						
14	*CW-320	20	27	31	444		49,900	Cummins NRT-6	300	2,100	6	743	Fluid Coupling L-2-F-H-32-3				2.1	1,280		15 1/2	27	68	85							
15	CW-220	20	27	31	438		58,515	GM-6-110-T	360	2,000	6	660	5.7	11.5	23.0	34.4	-	6.7		1,240	-	42	112	120						
16	CW-225	25	36	39	456		72,800	GM-6-110T	360	2,000	6	660	5.7	11.5	23.0	34.4	-	6.7		1,240	-	42	112	120						
17	EUCLOID S-7	7	9	10.5	336	HYDRAULIC		GM-471	148	2,100	4	284	4.2	8.2	16	22	(TC)	4.1-5.7	ELECTRIC	(b) 620	-	15	36.1	54						
18	S-12	12	17	20	374			GM-5-71	227	2,100	6	426	2.9	4.8	8.3	14.4	22.6	3.9		535 ^(b)	15 1/2	23	50	84						
19	*SS-12	12	17	20	396			GM-6-71	227	2,100	6	426	2.7	5.3	10.2	17.8	28	3.5		535 ^(b)	15 1/2	23	57	62						
20	*SS-18	18	25	27.5	436			Cummins NHR5	320	2,100	6	743	L-2.8	4.6	7.8	13.7	21.5	3.6		535 ^(b)	-	44	85	154						
21	S-18	21	30	35	436			GM-6-110	336	2,000	6	660	3.9	8.2	16.4	24.5	(TC)	3.2-4.0		1,100	-	40	77	178						
22	*SS-24	24	32	40	576			GM-6-110T ^(c)	360	2,000	6	660	5	10	21	31.8	(T.C.)	-		1,100 ^(b)	-	36	77	154						
23	TS-24 ^(d)	24	32	40	444			GM-6-110	336	2,000	6	660	6.2	11.9	27.3	-	(T.C.)	-		1,100 ^(b)	-	36	77	178						
24	INTERNATIONAL HARVESTER 55	10.3	14	21	499	CABLE	31,145	Cummins HR-6-B1	175	1,800	6	743	2.8	5.2	8.8	14.2	24.1	2.8	ELECTRIC	1,250	17	28	48	80						
25	75	15	20	27.5	559		40,850	Cummins NTO-6-B1	252	2,100	6	743	2.7	4.5	7.8	14.9	23.4	2.3		1,400	17	28	48	105						
26	295	24	31	36	456		63,935	DI-817	375	2,100	6	817	4.0	10.2	20.4	30.5	(TC)	H-4.5		1,920	-	32	80	160						
27	*495	24	31	36	472		63,185	L.H.	375	2,100	6	817	4.3	11.3	22.7	33.8	(TC)	H-5.0		1,909	-	32	80	160						
28	LeTOURNEAU, R.G. L-28 ^(a) INC.	20.5		30	657	ELECTRIC		Cummins NRT 10	335	2,100	6	347	D.C. ELECTRIC DRIVE Infinite Range To Fit Application						SAME AS FORWARD	Elec.	-	29	40	195						
29	L-50 Self-Loading ^(a)	41		55	780			Cummins VT-12-B1	600	2,100	12	1,485	D.C. ELECTRIC DRIVE Infinite Range To Fit Application																	
30	L-130 ^(a) Self Loading	105		130	1,200			2 Cummins VT-12-B1	600	2,100	12	1,485	D.C. ELECTRIC DRIVE Infinite Range To Fit Application																	
31	LeTOURNEAU-WESTINGHOUSE D	7.3	9	10	291	ELECTRIC	24,507	GM-4-71	143	2,100	4	284	2.9	5.4	10.5	18.3	26.1	2.8	ELECTRIC	2,800	15	16	34	48						
32	C	12.2	18	20	391		40,200	GM-6-71 ^(b)	226	2,100	6	426	3.3	6.4	12.2	21.3	33.5	4.2		3,764	17	20	48	100						
33	C (Power Shift)	12.2	18	20	391		42,743	GM-6-71 ^(b)	226	2,100	6	426	2.5	5.6	12.8	29.4	(TC)	1-5.4 2-12.4		3,764	-	20	48	100						
34	*C Speed pull	14	20	22	408		43,595	Cummins NRS-6-B1	276	2,100	6	743	L-2.8	5.4	10.3	18.0	28.3	2.8		3,764	16	-	44	100						
35	B	21	28	32.5	478		60,418	GM 6-110	335	2,000	6	660	L-2.6	4.7	9.2	16.0	19.7	2.7		6,592	16	9	19 3/4	147						
36	B (Power Shift)	21	28	32.5	478		62,352	GM 6-110T ^(c)	360	2,000	6	660	H-3.8	6.8	13.3	23.3	28.6	3.9		6,592	-	9	25	160						
37	OLIVER 990 Scraper (SS-767)	5.3	7	-	402	Hyd	16,995	GM 3-71	89 ^(d)	1,675	3	213	2.5	3.3	4.4	5.8	7.3 ^(d)	2.7 & 4.9	Elec.	-	14	12	-	30						
38	SEAMAN-GUNNISON 650-S	5	6	7	264	Hyd	16,500	IH 650-D	80	2,000	4	350	3.1	4.2	7.2	10.1	20.5	3.8	Elec.	260	12	11	38	48						
39	MM 5-5	5	6	7	264	Hyd	16,500	MM Diesel	80	1,800	4	336	3.1	4.2	7.2	10.1	20.5	3.8	Elec.	260	12	10	38	48						

* Two-Axle Tractor

(a) 30.2 in 6th gear

(b) Prime mover only; both, double

(c) Available with 335-HP Cummins NRT10

(d) All-wheel drive

(e) Two Engines

(f) Top of control panel

(g) Front to rear

(h) Available with 210-HP Cummins HRS-600

(i) Available with 335-HP Cummins NRT10-6-B1

(j) Net engine HP

(k) 13.0 in 6th gear

Specs for Your Files...

Construction Methods AND EQUIPMENT

OVERALL DIMENSIONS															CABLE						
Max. Width of Cut, in.	Max. Depth of Cut, in.	Max. Depth of Spread, in.	Type of Ejection	Length, in.	Width, in.	Height, in.	Height of Sides, in.	Bottom Dimensions, in.	Wheels, in. (Drive to Free)	Standard Tire, Tractor	Standard Tire, Scraper	Cable Drive Wheels, in.	Cable Scraper Wheels, in.	Weight, Shipping, Lbs.	WEIGHT DISTRIBUTION				Ejector Cable, Dia.	Steel Lift Cable, Dia.	Alloy Lift Cable, Dia.
															% on Drive Axle, Empty	% on Scraper Axle, Empty	% on Drive Axle, Full	% on Scraper Axle, Full			
97 1/2 116 116	24 3/4 13 7/8 14	16 5/8 18 24	FORCED POSITIVE	377 418 438	120 138 124	117 119 124	44 53 60	97 1/2 x 32 1/2 116 x 45 116 x 49	220 252 267	18.5 x 25 26.5 x 25 24.00-29	18.5 x 25 26.5 x 25 24.00-29	72 89 93	72 85 87.5	28,500 44,000 49,050	66 66 66	34 34 34	50 50 50	50 50 50	- - 1/2	- - 1/2	- 5/8 3/4
112 112 124 124 130	ANY PRACTICAL DEPTH	18.5 18 20 20 22	FORWARD POSITIVE	481 440 526 500 553	130 130 141 141 154	120 116 136 137 150	53 53 58 58 64	100 x 51 100 x 51 120 x 69 120 x 69 126 x 78	250 3/4 449 282 3/8 307 311	(12.00-29) 26.5-25 (14.00-24) 29.5-28 (14.00-24) (29.5-28)	26.50-25 26.5-25 29.50-29 29.50-29 33.5-33	78 78 88 88 88	78 78 88 88 88	42,945 47,150 58,170 59,980 68,505	41 68 42 33 40	35 32 35 33 41	37 53 37.5 52 37.0	40 47 48.5 48 51.5	1/2 1/2 1/2 1/2 1/2	1/2 1/2 1/2 1/2 1 1/4	5/8 3/4 3/4 3/4 7/8
84 114 120	11 14 16 1/2	18 1/2 23 28 1/2	FORWARD POSITIVE	390 449 526	101 134 144	102 113 135	51 49 60	84 x 40 114 x 52 120 x 65	233 278 325 1/2	23.5-25 26.5-25 33.5-33	23.5-25 26.5-25 33.5-33	81 94 104	72 91 94	28,000 45,000 72,500	68 68 68	32 32 32	53 52 53	47 48 47	- - -	- - -	- 19 11
87 120 120 120 120	15 16 18 19 20	21 1/2 20 22 1/2 24 20	POSITIVE ROLL OUT	358 460 504 519 574	102 142 142 143 147	104 120 119 131 148	47 61 64 1/2 64 1/2 75	87 x 85 120 x 121 120 x 121 120 x 121 120 x 121	216 285 268 297 347	18.00-25 29.5-25 (14.00-24) 29.5-29 27-33 33.5-32	18.00-25 29.5-25 29.5-29 29.5-29 27-33 33.5-32	76 92 94 102 102	66 92 92 90 91	32,500 56,000 64,500 68,000 85,500	70 66 46 69 66	30 34 34 31 34	56 54 42 55 54	44 46 45 45 46	1/2 9/16 1/2 9/16 9/16	1/2 9/16 1/2 9/16 9/16	9/16 3/4 3/4 3/4 3/4
84 118 118 124 124 124 124	10 1/2 14 15 15 1/2 13 1/2 15 13 1/2	20 27 29 22 24 22 26 1/2	POSITIVE ROLL OUT	358 423 488 546 494 564 545	96 134 134 139 141 141 141	101 117 112 105 132 123 132	86 x 82 102 x 114 1/2 102 x 114 1/2 120 x 122 120 x 136 136 x 123 136 x 120	214 251 245 277 303 303 312	18.00-25 24.00-25 (12.00-25) (12.00-25) (14.00-25) (14.00-25) (14.00-25)	18.00-25 24.00-25 21.00-25 24.00-25 27.00-33 27.00-33 27.00-33	73 80 79.5 78.5 91 98 91	73 89.5 89.5 90 91 91 91	26,500 46,100 45,250 56,000 68,400 67,000 80,000	69 66 39 33.5 34 43 55	31 34 36 33.5 34 36 45	55 53 39.5 44 52 40 48	45 47 45 44 48 48 52	- - - - - - -	- - - - - - -	1/2 3/4 3/4 3/4 3/4 3/4 3/4	
100 113 131 131	Unl. Unl. 16 16	19 21 1/4 21 21	POSITIVE ROLL OUT	400 472 536 595	131 138 138 138	112 122 134 133	49 61 70.5 70.5	108 x 58 114 x 72 7/8 127 x 76 127 x 76	233 279 336 317	26.5-25 29.5-29 27.00-33 (14.00-25) (27.00-33)	26.50-25 29.50-29 27.00-33 27.00-33 27.00-33	75.3 80.2 97 90	87 91 90.6 90.6	40,865 54,345 70,960 68,190	85 85 64 37	35 35 35 38	56 56 52 58	44 44 48 48	1/2 9/16 1/2 1/2	1/2 9/16 1/2 1/2	7/8 1 - -
121 121 150	16 16 30	19 19 26	FORCED POSITIVE	461 908 1,242	145 145 176	(140) (162) (168)	98 x 120 98 x 120 140 x 150	335 (140) 714 (140) 981 (140)	75" high x 30" wide 75" high x 30" wide 89" high x 40" wide	115 115 136	115 115 136	68,000 136,000 252,000	- - -	- - -	- - -	- - -	- - -	- - -	Electric Rack & Pinion Electric Rack & Pinion Electric Rack & Pinion	28 29 30	
84 114 114 114 120 120	UNLIMITED	24 16 16 21 20 20	FORWARD POSITIVE	336 447 447 492 532 532	96 136 136 136 140 140	109 121 121 121 145 145	56 1/2 47 47 55 1/4 63 63	84 x 39 60 x 114 60 x 114 60 x 114 67 x 120 67 x 120	193 268 268 387 322 322	18.00-25 24.00-25 24.00-25 (12.00-25) 24.00-25 27.00-33	18.00-25 24.00-25 24.00-25 24.00-25 27.00-33 27.00-33	74.5 82 82 82 98 98	74.5 82 82 82 93 93	22,830 43,840 44,920 49,000 69,400 70,300	69 66 66 40 67 67	31 34 34 35 33 33	58 53 53 38 53 53	42 47 47 46 47 47	1/2 5/8 5/8 5/8 5/8 5/8	1/2 5/8 5/8 5/8 5/8 5/8	1/2 3/4 3/4 3/4 3/4 3/4
84	16 1/2	10		385	102	75	48	-	221	18.00-25	14.00-20	-	-	17,000	-	-	30	70	-	-	37
84 84	8 8	14 14	POSITIVE ROLL OUT	189 189	85.5 85.5	83 83	42 42	84 x 76 84 x 76	188 188	18.00-25 11.25-20	11.25-20	57 57	71 71	16,300 16,300	75 75	25 25	60 60	40 40	- -	- -	- -

Allis-Chalmers Mfg. Co., Construction Machinery Div., Milwaukee 1, Wis.
 Caterpillar Tractor Co., Peoria, Ill.
 Clark Equipment Co., Construction Machinery Div., Benton Harbor 21, Mich.
 Curtiss-Wright Corp., South Bend Div., South Bend, Ind.
 Euclid Div., General Motors Corp., Cleveland 17, Ohio

International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.
 R. G. LeTourneau Inc., Longview, Tex.
 LeTourneau-Westinghouse Div., Westinghouse Air Brake Co., Peoria, Ill.
 Oliver Corp., Industrial Div., Cleveland 17, Ohio
 Seaman-Gunnison Corp., Milwaukee 15, Wis.

Good service practices, says this expert, pay off in longer equipment life, less downtime, and lower repair costs.

ROLLERS

GOOD SERVICE practices and a preventive maintenance program do not cost—they pay.

They pay in longer equipment life, less equipment downtime, lower equipment repair costs, and reduced need for extra or standby equipment.

When a contractor bids a job he must figure a certain production rate for each piece of his equipment. If the unit fails, he not only loses the production of that unit but, in many cases, the production of other units as well.

This is particularly true on a paving job. If, for instance, a roller on an asphalt paving job breaks down, it is conceivable that its loss could tie up the production of the asphalt plant, the pavers, and the trucks until either a replacement roller is put on the job or the inoperative roller is repaired. To minimize this downtime as much as possible, most successful constructors, private and public, adhere to a good preventive maintenance program.

Most manufacturers furnish with their equipment an operators or maintenance handbook with periodic lubrication and service check lists. Here's a good daily, weekly, and seasonal (spring and fall) check list to follow for the servicing of three-wheel and tandem rollers.

Daily Check

Each day, before starting the engine:

- Check engine crankcase level.
- Check cooling system level.
- Inspect engine cooling system, hydraulic system, torque con-

verter, and roller for leaks.

- Remove water from sediment bowl of fuel strainer.
- Clean and refill air cleaner cup with fresh oil to level indicated.
- Pressure lubricate as shown on lubrication chart.
- Adjust forward and reverse clutches as needed.

Each day, after starting the engine:

- Observe engine oil pressure.
- Examine roller for leaks and needed repairs.

Weekly Check

Once a week, before starting the engine, repeat the daily check and make the following additional checks:

- Clean air cleaner; disassemble and clean all parts including air intake to carburetor.
- Check and service battery.
- Lubricate governor.
- Check fan and generator v-belt tension.
- Check hydraulic pump v-belt tension.
- Check hydraulic oil level.
- Check transmission oil level.
- Check countershaft gear housing oil level.
- Check torque converter oil level.
- Check and tighten all cap screws as required.
- Adjust brake, steering roll, compression roll, and kingpin bearings as required.

Seasonal Check

- Drain hydraulic system, clean tank, and refill.

- Drain transmission and countershaft gear housing, flush, and refill with fresh gear lubricant.

- Inspect bearings, clutches, roll scrapers and mats, and other wearing parts, then replace as needed.

You might add, to the above items generally found in the service tables supplied with the rollers, these following checks. Done regularly they will add materially to the performance and life of your roller.

- Make frequent inspections to see that no material becomes caught between the scraper blade and the roll surface. If rocks or other abrasive materials collect behind the scraper blade, they can cause grooving and make necessary the replacement or refinishing of the roll surface.

- Maintain proper tension on the scrapers.

- Never use grader blades or other similar hard material for roll scrapers.

- Periodically inspect the steering and compression roll mats and replace them when necessary.

- Check machine for worn cocoa mats and exposed mounting bolts that can cause grooving of the rolls.

- Keep forward and reverse clutches properly adjusted to prevent slippage, overheating, and accelerated wear. The clutch is correctly adjusted when it is just tight enough so that you feel a snap on the lever when the clutch is engaged.

- Adjust forward and reverse

About the Author



C. O. EVANS is service manager for the Galion Iron Works and Manufacturing Company. He's been with the firm 10 years as a service specialist.

Special report to Caterpillar D8 Tractor owners:

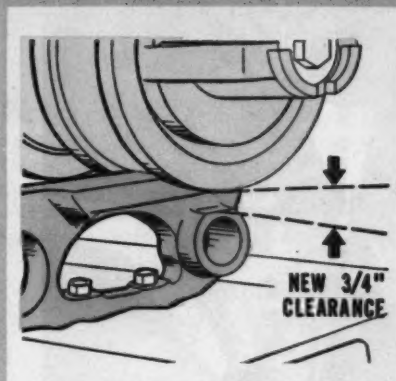
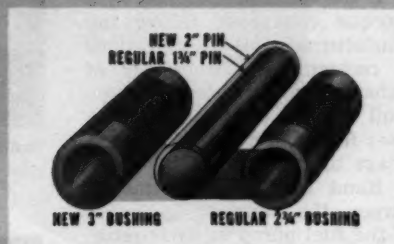


Parts you can trust
Dependable round-the-clock service

NEW TRACK COMPONENTS AVAILABLE FOR MOST D8 TRACTORS... GIVE UP TO 44% LONGER LIFE

Caterpillar's continuous research and testing pay off for you with the development of superior D8 track components. The next time you replace track parts, specify these new components. They last longer and require less maintenance. Here's what's available for 2U, 13A, 14A and 15A tractors:

30% STRONGER PINS AND BUSHINGS have more wear area to extend life. The big track pins are $\frac{1}{4}$ " larger in diameter and heat-treated deep to resist wear... pins will not bend and cause uneven wear. The large contact areas of the bushings are hardened deep, both inside and out. Under field conditions these bushings have lasted up to 44% longer than regular bushings.



STRONGER, LONGER, HIGHER TRACK LINKS are 3 lb. heavier, 1" longer and $\frac{1}{4}$ " higher. New length means fewer track sections are required. Increased height gives up to $\frac{1}{4}$ " more link pin boss-roller flange clearance. Improved steel used in these links permits 80% deeper rail hardening and greater strength—pins and bushings stay tight in the links even under the roughest application.

NEW TRACK SHOE GROUSERS ARE 20% THICKER at the tip and are hardened much deeper than on regular shoes. The new shoe as a whole is bigger and heavier to resist bending, impact and wear. Track hardware used with the new track components is stronger—bolt diameter increased from $\frac{3}{4}$ " to $\frac{7}{8}$ ".



NEW DESIGN REGULAR DESIGN

NEW DESIGN BORALLOY SPROCKET REPLACEMENT RIMS are available to accommodate the increased pitch of the longer links and bigger track bushings. Teeth are precision-machined to provide exact fit with track bushings—a major contribution to longer bushing life.

SEE YOUR CATERPILLAR DEALER for more information on extending your D8 track life. He has parts you can trust and round-the-clock service. See him today.



LINK RAIL HEAT TREAT PATTERNS

NEW

REGULAR

GROUSER HEAT TREAT PATTERNS



NEW



REGULAR

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

ROLLERS . . . continued

clutches of the "overcenter" type as follows:

1. Place clutch in neutral.
2. Pull out lockpin A from adjusting yoke B.
3. Turn adjusting yoke B to the right (clockwise) to tighten, or turn adjusting yoke B counterclockwise to loosen.

- Take care in selecting a source of water for the sprinkling system. Dirty water, leaves, and debris will clog the system and make it inoperative. Clean and flush the sprinkling pipes periodically. Also, drain and clean the sprinkling tank.

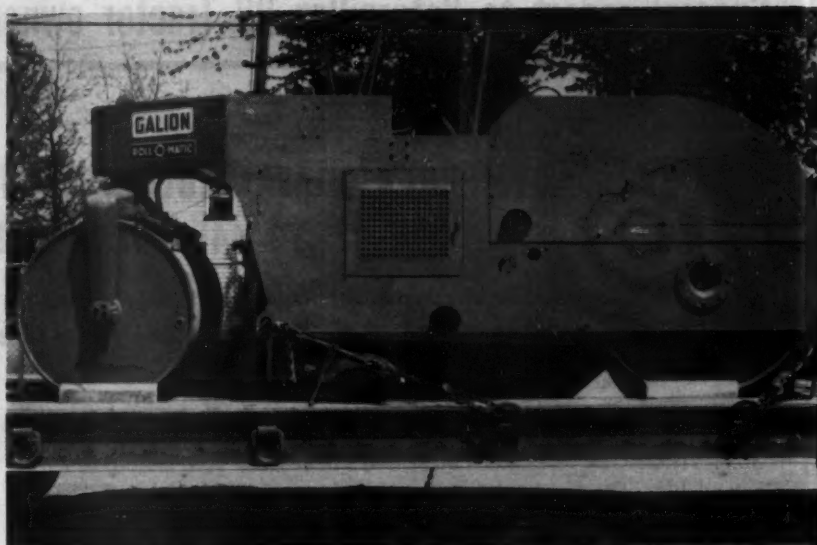
- If the roller is equipped with a torque converter, follow the manufacturer's oil specifications and recommended frequency of oil changes to the letter. Improper oil in the converter system causes foaming, overheating, and damage to parts.

- Hand lubricate the linkage between the tailshaft governor and the fuel pump or carburetor. Keep the governor in good adjustment. Bad adjustment causes engine surging, low power, and erratic roller travel speed.

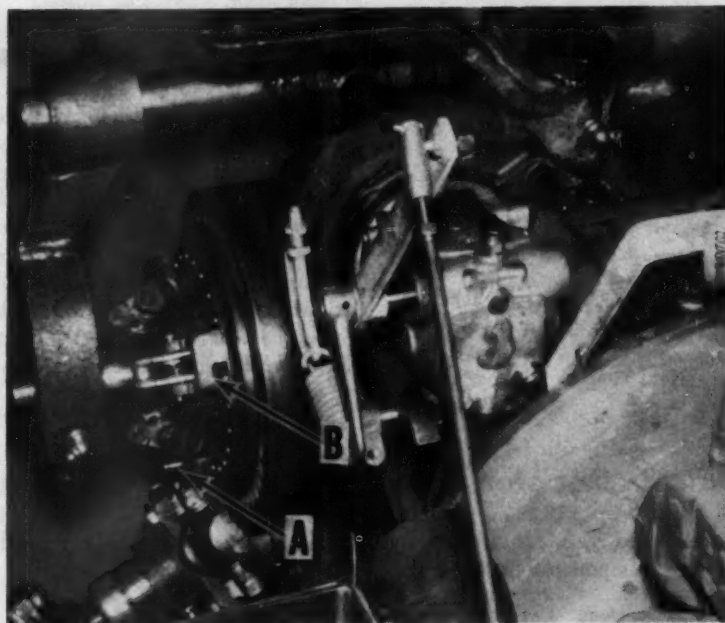
Many times the engine is blamed for low power. The fault sometimes lies with the governor. A stall speed test will find the cause. Mount a tachometer on the engine, disconnect the governor linkage from the fuel pump or carburetor, lock the drive roll with the brake, and operate the fuel pump arm or carburetor by hand. If the stall speed—read on the tachometer—is below the published torque converter stall speed, the engine may be at fault. But if the stall stands at or above the published rating, then it is possible the governor needs adjusting. Don't hold the torque converter in a stall condition longer than 30 sec at a time or it may overheat and be damaged.

- A roller can become damaged in transportation, unless some precautions are taken. The drive rolls should be blocked securely front, rear, and sides. The guide rolls should be blocked on the sides only. If blocking is used in front or rear of the guide roll, damage can be done to the kingpin and its bearings through starting and stopping of the transporting vehicle.

- Each spring, repair rollers damaged during winter storage.
- Before storing a roller for



TRANSPORTING A ROLLER—Drive rolls should be blocked securely front, rear, and sides to prevent the roller from damage when it is being moved from job to job.



TO ADJUST CLUTCH—On overcenter type clutches place clutch in neutral, pull lockpin A from yoke B, then turn yoke B clockwise to tighten, or counterclockwise to loosen.

the winter take these precautions:

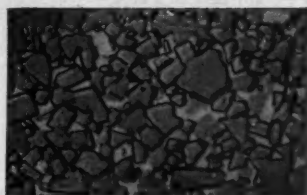
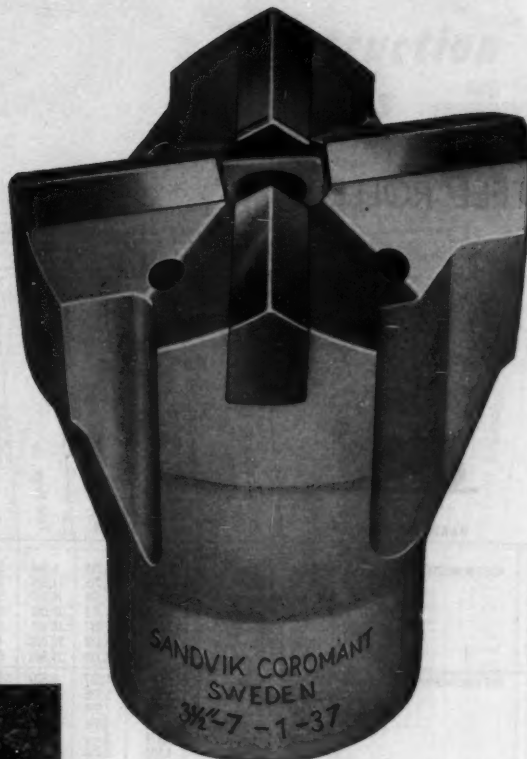
1. Drain the sprinkler system.
2. Drain water ballast from rolls.
3. Drain radiator and engine block and attach warning "drained" tags.
4. Drain water from torque converter oil cooler.
5. Remove storage battery,

store in a cool dry place, protect from freezing, check regularly, and get a refresher charge as required.

6. Drain fuel tank and run carburetor dry.

7. Refer to engine manual for preparation of engine storage, and service of engine during storage.

Longer bit life— with *new* Sandvik Coromant Bits



Sandvik Coromant Tungsten Carbide
(Microphoto) Uniformity of size, even distribution of grain are marked. Free from porosity and impurities—therefore stronger, longer-lived.



Low quality Tungsten Carbide
(Microphoto) Black marks are contaminations caused by deficient production control. They weaken the carbide, reduce its working life.

Sandvik Coromant Detachable Bits are Available in the following Thread Sizes and Bit Diameters

		Available Diameters, in inches																
Type	Thread	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/2	4	4 1/2	5					
S H O U L D E R	TAPER	x	x	x	x													
	F		x	x														
	113		x															
	H			x	x	x	x	x										
	115			x	x													
	D					x	x	x	x	x	x	x	x					
B O T T O M I N G	K													x	x	x	x	
	1" Rope				x	x	x	x	x									
	1 1/4" Rope					x	x	x	x					x				
	400					x	x		x									
	1 1/2" Rope									x	x	x	x					
	600										x	x	x					
	700													x	x			
	17.5															x	x	
	2" Rope															x	x	x
	1000																x	

NEXT time you buy bits, specify Sandvik Coromant because they give more footage per bit, lower drilling costs. Here's why:

- 1 Only first-quality tungsten carbide is used—as shown in the microphotos above. This means less wear, longer life and a better job.
- 2 The bodies are precision-made of high quality alloy steel—tough enough to take the strain throughout the extra-long bit life.
- 3 The bigger Sandvik Coromant bits are all of X-design, which prevents rifling. No wonder Sandvik Coromant inserts are the most widely used in the world, drilling more than one billion feet every year.

SANDVIK COROMANT bits are supplied through Atlas Copco, the world's largest manufacturer of rock drills, who also supply Sandvik Coromant integral steels—the most widely used in the world—and Sandvik Coromant extension steel equipment.

Write or phone today for further details to either of the addresses below:

610 Industrial Avenue
Paramus, New Jersey
COlfax 1-6800

Atlas Copco

930 Brittan Avenue
San Carlos, California
LYtell 1-0375

MAKE AND MODEL *Page 106—CONSTRUCTION METHODS and Equipment—July 1959

Construction Methods AND EQUIPMENT

Specs for Your Files...

ROLL DIMENSIONS, IN.						POWER TRAIN										DIMENSIONS, OVERALL, IN.						PRICE			
Overall Rolling Width	Guide Roll, No. of Sections	Guide Roll, Dia. x Width, (Total All Sections)	Guide Roll, Thickness	Compression Roll(s), Dia. x Width	Compression Roll(s), Thickness	ENGINE					TRANSMISSION					Clutch Type	Steering, Type	Length	Width	Height	Wheelbase		Ground Clearance	Outside Turning Radius	
						Make	Model	Gas or Diesel	Max. Brake HP	Rated RPM	No. of Cylinders	No. of Cycles	Fuel Tank Capacity, Gal.	No. of Forward Speeds	Range, Forward Speeds, MPH										No. of Reverse Speeds
2	32x40	1/2	48x42	5/8	Wisc.	VG40	G	36	2200	4	4	12 1/2	1.13-4.46	2	1.13-4.46	Fric.	Hyd	129	32	51	85	11.3	170	\$4,615	1
2	41x50	5/8	53x50	7/8	Ford	J	G	75	1650	8	4	28	.88-3.3	2	.88-3.3	TC	Hyd	177	64	72	120	15.5	216	7,432	2
2	48x54	5/8	60x54	1 1/4	Ford	J	G	75	1650	8	4	28	.99-3.72	2	.99-3.72	TC	Hyd	190	68	75	130	19	240	8,999	3
2	48x54	5/8	60x54	1 1/4	Ford	J	G	75	1650	8	4	28	.99-3.72	2	.99-3.72	TC	Hyd	190	68	75	130	19	240	9,624	4
2	41x40	3/4	60x18	1 1/2	Ford	J	G	75	1650	8	4	33	.99-3.73	2	.99-3.73	TC	Hyd	205	67	67	130	15	227	3,604	5
2	44x44	3/4	69x20	1 1/2	Ford	J	G	75	1650	8	4	33	1.14-4.3	2	1.14-4.3	TC	Hyd	207	75	71	130	19.5	231	10,291	6
2	44x44	3/4	69x24	1 1/2	Ford	J	G	75	1650	8	4	33	1.14-4.3	2	1.14-4.3	TC	Hyd	207	83	71	130	19.5	231	10,943	7
2	30x38	NA	40x38	NA	Cont.	Y-112	G	29	2000	4	4	12	5-5.3	2	5-5.3	TC	Hyd	127	49	60	88	13	174	NA	8
2	30x38	NA	40x38	NA	Cont.	Y-112	G	29	2000	4	4	12	5-5.3	2	5-5.3	TC	Hyd	127	49	60	88	13	174	NA	9
2	40x50	NA	53x50	NA	Cont.	F-162	G	49	2450	4	4	26	1-5.4	2	1-5.4	TC	Hyd	173	66	87	128	12.5	214	NA	10
2	40x50	NA	53x50	NA	Cont.	F-226	G	48	1400	6	4	30	1-1.5	4	1-1.5	TC	Hyd	172	66	99	118	17	214	NA	11
2	40x50	NA	53x50	NA	Cont.	F-226	G	48	1400	6	4	30	1-1.5	4	1-1.5	TC	Hyd	172	66	99	118	17	214	NA	12
2	40x50	NA	53x50	NA	Cont.	F-162	G	49	2450	4	4	26	1-5.4	2	1-5.4	TC	Hyd	173	66	87	128	12.5	214	NA	13
2	40x50	NA	53x50	NA	Cont.	F-162	G	49	2450	4	4	26	1-5.4	2	1-5.4	TC	Hyd	173	66	87	128	12.5	214	NA	14
2	48x54	NA	60x54	NA	Cont.	F-226	G	72	2450	6	4	34	1-5.6	4	1-5.6	TC	Hyd	196	70	91	131	14	236	NA	15
2	48x54	NA	60x54	NA	Herc.	Jx D	G	64	1400	6	4	30	1-1.5	4	1-1.5	TC	Hyd	196	72	102	131	19	236	NA	16
2	48x54	NA	60x54	NA	Herc.	Jx D	G	64	1400	6	4	30	1-1.5	4	1-1.5	TC	Hyd	196	72	102	131	19	236	NA	17
2	48x54	NA	60x54	NA	Cont.	F-226	G	72	2450	6	4	34	1-5.6	4	1-5.6	TC	Hyd	196	70	91	131	14	236	NA	18
2	63x54	NA	60x54	NA	Herc.	Jx LD	G	72	1400	6	4	30	1-1.5	4	1-1.5	TC	Hyd	273	72	102	208	19	356	NA	19
2	44x44	NA	69x20	NA	Herc.	Jx LD	G	72	1400	6	4	35	1-1.5	4	1-1.5	TC	Hyd	209	76	81	128	15	228	NA	20
2	44x44	NA	69x20	NA	Herc.	Jx LD	G	72	1400	6	4	35	1-1.5	4	1-1.5	TC	Hyd	209	76	81	128	15	228	NA	21
2	28x32	3/8	-	1 1/8	Wis.	TH	G	14	2400	2	4	6.5	1-5.3	1	1-5.3	Fric.	Mech.	112	44	59	74	8	180	3,175	22
2	28x32	3/8	-	2 1/2	Wis.	VE4	G	20	2400	4	4	6.5	1-5.3	1	1-5.3	Fric.	Mech.	112	44	59	74	9	180	3,450	23
2	34x40	1/2	48x42	3/4	Wis.	VH-40	G	30	2800	4	4	9	1-5.5	2	1-5.5	Fric.	Hyd	125	52	75	78	15	180	NA	24
2	34x40	1/2	48x42	3/4	Wis.	VH-40	G	30	2800	4	4	9	1-5.5	2	1-5.5	Fric.	Hyd	125	52	75	78	15	180	NA	25
2	40x50	3/4	53x50	3/4	Chry.	30	G	63	1800	6	4	32	1-5	2	1-5	Fric.	Hyd	175	61	82	125	14	216	NA	26
2	40x50	3/4	53x50	3/4	Chry.	30	G	63	1800	6	4	32	1-5	2	1-5	Fric.	Hyd	175	61	82	125	14	216	NA	27
2	48x54	3/4	60x54	1	Chry.	52	G	73	2000	8	4	32	8-5.5	2	8-5.5	Fric.	Hyd	194	66	96	135	16	234	NA	28
2	48x54	3/4	60x54	1	Chry.	52	G	73	2000	8	4	32	8-5.5	2	8-5.5	Fric.	Hyd	194	66	96	135	16	234	NA	29
2	33x40	5/8	48x42	3/4	Wisc.	VH-4	G	26.5	2200	4	4	7	1-9.4.5	2	1-9.4.5	Fric.	Hyd	132	80	60	86	12	202	4,750	30
2	33x40	3/4	48x42	1	Wisc.	VH-4	G	26.5	2200	4	4	7	1-9.4.5	2	1-9.4.5	Fric.	Hyd	132	80	60	86	12	202	5,150	31
2	40x50	3/4	53x50	1 1/4	Cont.	F-162	G	81	2400	6	4	25	1-4.5	2	1-4.5	TC	Hyd	174	60	67	124	13	216	7,175	32
2	48x54	3/4	60x54	1 1/4	Cont.	F-226	G	73	2400	6	4	25	1-5.5	2	1-5.5	TC	Hyd	199	69	96	141	15	228	8,725	33
2	34x40	5/8	48x42	13/16	Cont.	Y-112	G	32	2400	4	4	11	5-5.6	2	5-5.6	TC	Hyd	150	50	80	103	15	168	NA	34
2	34x40	5/8	48x42	13/16	Cont.	Y-112	G	32	2400	4	4	11	5-5.6	2	5-5.6	TC	Hyd	150	50	80	103	15	168	NA	35
2	40x50	13/16	53x50	15/16	IHC	UB-220	G	70	2400	4	4	25	5-5.5	2	5-5.5	TC	Hyd	187	62	87	134	15	228	NA	36
2	40x50	13/16	53x50	15/16	IHC	UB-220	G	70	2400	4	4	25	5-5.5	2	5-5.5	TC	Hyd	187	62	87	134	15	228	NA	37
2	48x54	13/16	60x54	1 1/8	IHC	UB-264	G	90	2400	4	4	25	5-5.5	2	5-5.5	TC	Hyd	204	67	94	142	16	228	NA	38
2	48x54	13/16	60x54	1 1/8	IHC	UB-264	G	90	2400	4	4	25	5-5.5	2	5-5.5	TC	Hyd	204	67	94	142	16	228	NA	39
4	48x54	13/16	60x54	1 1/8	Cont.	M-330	G	92	2400	4	4	31	5-5.5	2	5-5.5	TC	Hyd	270	69	92	209	14	356	NA	40
2	38x41	19/16	60x20	1 3/4	Cont.	F-162	G	49	2400	4	4	NA	5-5.5	2	5-5.5	TC	Hyd	190	74	71	118	15.5	177	NA	41
2	38x41	2 1/4	60x20	2 1/2	Cont.	F-162	G	49	2400	4	4	NA	5-5.5	2	5-5.5	TC	Hyd	190	74	71	118	15.5	177	NA	42
2	44x44	2	69x20	2 3/8	IHC	UB-264	G	90	2400	4	4	38	5-5.5	2	5-5.5	TC	Hyd	223	84	81	135	18	217	NA	43
2	44x44	2 1/2	69x20	3 1/4	IHC	UB-264	G	90	2400	4	4	38	5-5.5	2	5-5.5	TC	Hyd	223	84	81	135	18	217	NA	44
2	38x41	13/16	60x20	2 1/8	Cont.	F-162	G	49	2400	4	4	NA	5-5.5	2	5-5.5	TC	Hyd	190	74	71	118	15.5	177	NA	45
2	38x41	1 7/8	60x20	2 1/8	Cont.	F-162	G	49	2400	4	4	NA	5-5.5	2	5-5.5	TC	Hyd	190	74	71	118	15.5	177	NA	46
2	44x44	1 3/8	69x20	1 1/2	IHC	UB-264	G	90	2400	4	4	38	5-5.5	2	5-5.5	TC	Hyd	223	84	81	135	18	217	NA	47
2	44x44	1 3/8	69x20	1 1/2	IHC	UB-264	G	90	2400	4	4	38	5-5.5	2	5-5.5	TC	Hyd	223	84	81	135	18	217	NA	48
2	34x49	5/8	48x42	3/4	Herc.	I x B	G	41	2400	4	4	16 1/2	5-5.6	1	5-5.6	TC	Hyd	131	55	73	84	12	138	NA	49
2	40x50	5/8	53x50	7/8	Herc.	GO-173	G	58.5	2400	4	4	25 1/2	5-5.5	2	5-5.5	TC	Hyd	177	60	84	121	14	210	NA	50
2	40x50	5/8	53x50	7/8	Herc.	GO-173	G	58.5	2400	4	4	25 1/2	5-5.5	2	5-5.5	TC	Hyd	177	60	84	121	14	210	NA	51
2	48x54	3/4	60x54	1	Herc.	GO-226	G	77	2400	4	4	35	5-3.4	2	5-3.4	TC	Hyd	197	66	96	132	16	228	NA	52
2	48x54	3/4	60x54	1	Herc.	GO-226	G	77	2400	4	4	35	5-3.4	2	5-3.4	TC	Hyd	197	66	96	132	16	228	NA	53
2	44x44	1 3/4	69x20	1 3/4	Herc.	GO-339	G	100	2000	6	4	40	4-3.8	2	4-3.8	TC	Hyd	206	76	81	127	18.5	243	NA	54

STEEL ROLLERS (continued)

MAKE AND MODEL *

			TYPE	WEIGHT, LBS.									COMPRESSION LB./LINEAL IN./ROLL FACE						
			Portable Tandem, Tandem, 3-Axle Tandem (3AT), 3-Wheel																

*With a dry weight of at least 6,000 lb.

**Practically all models have a choice of gasoline engines.

Only standard engine is listed. Price covers machine with standard engine.

† Available with diesel engine

‡ All models available with 4-speed transmission.

(a) Available with 24-in. rolls.

(c) Available with 22-in. rolls.

(d) Available with 20-in. rolls.

(e) Available with 18-in. rolls.

(f) Available with torque converter and 2-range transmission (direct drive is standard)

(g) With machine in rolling position (wheels retracted).

(h) Torque converter available.

(i) Available with Cont. Y-112 WC engine.

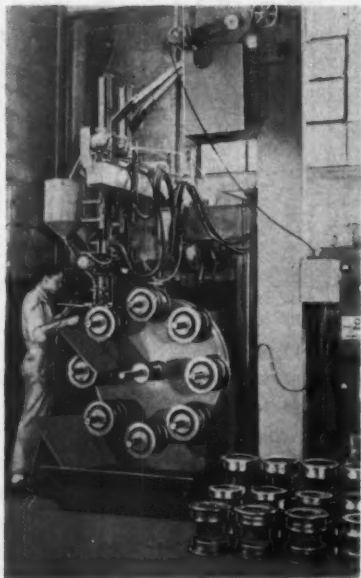
(j) Speeds variable on torque converter models.

(k) Two-range transmission for standard.

(l) Available with direct drive.

NA Specification not available from the manufacturer.

Revolutionary *Rexarc* Enables High Speed Production in Tractor Roller Rebuilding



(Pictured Above) A complete Rexarc installation at Michigan Tractor & Machinery Co., Detroit, Michigan.

Here is the new *Rexarc* MS-8 Automatic Twin Head Roller and Idler Welder and Positioner that mounts 8 rollers at a time. Hydraulic indexing enables virtually a continuous automatic welding operation. Twin heads build up both sides of roller simultaneously.

Factory engineer trains your operator, assuring excellent results from the very beginning of welding operations, at no additional cost.

- The new Rexarc Automatic Flux Circulating System assures profits unlimited. An adequate flux supply is maintained automatically at all times, eliminating manual flux handling. The operator just empties a new bag of flux occasionally onto the vibrating screen—that's all.

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Manufactured by

THE SIGHT FEED GENERATOR COMPANY

SALES OFFICES AND FACTORY, WEST ALEXANDRIA, OHIO, U.S.A.

Specs for Your Files...

Construction Methods AND EQUIPMENT

ROLL DIMENSIONS, IN.					POWER TRAIN												DIMENSIONS, OVERALL, IN.						PRICE			
Guide Roll, No. of Sections	Guide Roll, Dia x Width, (Total All Sections)	Guide Roll, Thickness	Compression Roll(s), Dia. x Width	Compression Roll(s), Thickness	Make **	ENGINE					TRANSMISSION							Length	Width	Height	Wheelbase	Ground Clearance	Outside Turning Radius	FOB, Factory, Standard Model		
						Model	Gas or Diesel	Max. Brake HP	Rated RPM	No. of Cylinders	No. of Cycles	Fuel Tank Capacity, Gal.	No. of Forward Speeds	Range, Forward Speed, MPH	No. of Reverse Speeds	Range, Reverse Speed, MPH	Clutch Type								Steering, Type	
2	40x50	3/4	52x50	7/8	Herc.	GO-260	G ²	90	2400	6	4	NA	4	1-6	4	1-6	TC	Hyd	187	57	80	138	10	243	7,000	59
2	40x50	3/4	52x50	7/8	Herc.	GO-260	G ²	90	2400	6	4	NA	4	1-6	4	1-6	TC	Hyd	187	57	80	138	10	243	7,700	60
2	48x54	1	60x54	1	Herc.	GO-298	G ²	105	2400	6	4	NA	4	1-6	4	1-6	TC	Hyd	205	65	88	148	16	238	8,700	61
2	36x35	3/4	48x18	3/4	1 HC	U175	G ²	50	2000	4	4	NA	5	25-8	5	25-8	TC	Hyd	169	69	60	101	13	192	7,200	62
2	38x40	7/8	55x18	7/8	Herc.	GO-260	G ²	90	2400	6	4	NA	5	25-10	5	25-10	TC	Hyd	177	72	66	110	16	NA	8,400	63
2	42x44	1	60x20	1	Herc.	GO-260	G ²	90	2400	6	4	NA	5	25-10	5	25-10	TC	Hyd	194	79	79	125	16	204	9,200	64
2	44x44	1 1/8	69x20	1 1/8	Herc.	GO-298	G ²	105	2400	6	4	NA	5	25-6	5	25-6	TC	Hyd	219	79	79	138	21	216	10,100	65
2	30x35	3/4	48x38	3/4	Wisc.	VF-4D	G	75	2400	4	4	9	2	2-4	2	2-4	Fric.	Hyd	129	47	59	84	12	180	4,895	66
2	40x50	3/4	54x50	1	Cont.	FA-225	G ²	73	2400	6	4	35	2	1.5-5.5	2	1.5-5.5	TC	Hyd	164	60	88	114	18	228	6,500	67
2	48x54	1	60x54	1 1/4	Cont.	FA-225	G ²	73	2400	6	4	35	2	1.5-5.5	2	1.5-5.5	TC	Hyd	181	64	90	124	17	248	7,500	68

Western Works, Baldwin-Lima-Hamilton Corp., 601 N. Farnsworth, Aurora, Ill.
Springfield Roller Co., 1210 Kenton St., Springfield, Ohio
Mfg. Co., 3849 N. Palmer St., Milwaukee 12, Wis.
Mfg. Co., 1350 Santa Fe Ave., Los Angeles 21, Calif.
Rollers: Shovel Supply Co., 4900 Hines Blvd., Dallas, Tex.

Galion Iron Works & Mfg. Co., Galion, Ohio
Huber-Waco Co., 202 N. Greenwood St., Marion, Ohio
Ingram rollers: Acme Iron Works, 540 Calobra Ave., San Antonio, Tex.
Seaman-Andwall Corp., Elm Grove 4, Wis.

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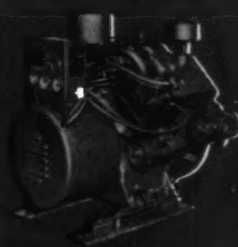
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Diesel Engines from 9 to 18 HP, Air and Water Cooled—Natural Gas Engines 15 HP, Air Cooled.



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Distributors in major working areas of the United States, Canada and Latin America.
Representatives in the Near East, Far East, Europe and The United Kingdom.

PNEUMATIC-TIRED ROLLERS



MAKE AND MODEL

			WEIGHT, LBS.						COMPACTION*			WHEELS									
			Empty	With Water Ballast	With Wet Sand Ballast	Max. Weight Per Wheel	Water Ballast Capacity, Gal.	Sand Ballast Capacity, Cu. Ft.	Empty	With Water Ballast	With Wet Sand Ballast	Total Rolling Width, In.	No. of Wheels, Front	No. of Wheels, Rear	Amount of Tire Overlap, In.	Tire Size, Standard	Tire Ply, Standard	Recommended Min. Tire Pressure, Psi	Recommended Max. Tire Pressure, Psi	Tire Ply, Optional	
1	BROS	SP-54-B	5,800	13,000	20,000	2,220	860	115	85.3	191	294	68	5	4	1/2	7.50-15	4	25	34	6	
2		SP-730-B	22,150	36,800	60,000	8,571	2,513	332	260	433	706	85	3	4	1	13.00-24	18	30	100	22-25	
3	BROWNING	SPR-9	6,550	—	18,900	2,100	150	100	96	—	278	68	5	4	1/2	7.50-15	4	35	55	6	
4		SPR-4	8,400	—	20,750	2,100	150	100	96	—	278	60	(c)	4	1/2	7.50-15	4	35	55	6	
5		SPR-9-A	6,400	—	18,750	2,080	150	100	94	—	276	68	5	4	1/2	7.50-15	4	35	55	6	
6		SPR-9-B	6,330	—	18,650	2,070	150	100	93	—	274	68	5	4	1/2	7.50-15	4	35	55	6	
7		SPR-11	8,300	—	26,850	2,440	290	149	99	—	319	84	5	6	1/2	7.50-15	4	35	55	6	
8		SPR-13	8,460	—	27,000	2,080	290	149	85	—	272	99 1/2	7	6	1/2	7.50-15	4	35	55	6	
9		25-T-11	18,470	—	50,000	4,545	490	300	196	—	532	94	5	6	1/2	9.00-20	12	60	100	—	
10	30-T-7	21,300	—	66,500	9,500	520	390	250	—	783	85	3	4	1	13.00-24	18	70	100	22-25		
11	BUFFALO-SPRINGFIELD	PSR-9	7,000	13,300	20,650	2,300	830	111	181	264	332	68	4	5	1	7.50-15	6	35	60	10	
12		PSR-30	23,400	39,575	60,280 ^(a)	8,600	1,948	271	274	460	700	86	3	4	1/2	13.00-24	18	60	100	22-25	
13	CHESTER	9W-PDA	7,000	14,500	22,000	2,450	900	120	97	202	306	66	4	5	3/4	7.50-15	6	50	60	—	
14	FERGUSON (Shovel Supply Co.)	SP-10	7,170	—	21,470	2,385	—	110	106	—	315	68	4	5	1	7.50-15	4	34	50	6	
15		SP-12	8,270	—	24,800	2,255	—	147	100	—	300	83	5	6	1	7.50-15	4	34	50	6	
16		2511	16,050	—	50,000	4,545	—	283	166	—	520	96	5	6	1	8.00-20	10	60	90	12	
17	GALION	9-T-12	8,400	—	24,400	2,722	—	132	117	—	340	68 1/2	5	4	1/2	7.50-15	4	—	35	6-10	
18	GRACE	11-H	6,500	12,000	16,700	2,000	650	85	76	143	200	84	5	6	1/2	7.50-15	4	28	32	6	
19		30-B	16,750	NA	65,000	9,225	NA	400	190	NA	738	88	3	4	1	13.00-24	18	60	120	12	
20	ROSCO	SR-904-T	6,600	12,912	19,730	2,192	755	101	96	187	286	69	5	4	3/8	7.50-15	4	35	35	6	
21		SR-904	6,600	12,912	19,730	2,192	755	101	96	187	286	69	5	4	3/8	7.50-15	4	35	35	6	
22		SR-9-T-2	6,800	14,420	19,950	2,216	748	100	99	208	290	69	5	4	3/8	7.50-15	4	35	35	6	
23	SEAMAN-ANDWALL	5620	15,900	30,000	42,560	2,600	1,678	188	117	220	313	92	8	9	5 3/4	7.50-15	6	—	55	—	
24	SEAMAN-GUNNISON	7-20 DTR ^(b)	13,600	18,600	40,000	3,600	600	175	R or S ^(b)	0-450	(R-86 S-72)	2	8	—	(F-15-26 R-7.50-15)	10	12	30	—		
25		9-27 DTR ^(b)	17,600	24,400	54,000	4,000	750	175	R or S ^(b)	0-500	(R-86 S-72)	2	8	—	(F-18.00-26 R-7.50-15)	10	10	25	—		
26		10-30 RD ^(b)	19,500	25,200	60,000	5,200	600	250	R or S ^(b)	0-650	(R-89 S-84)	2	8	—	(F-18.00-26 R-7.50-15)	10	10	25	—		
27		7-20 DTRV ^(m)	15,200	21,200	40,000	3,600	600	160	R or S ^(m)	0-450	(R-86 S-72)	2	8	—	(F-15-26 R-7.50-15)	10	12	30	—		
28		9-27 DTRV ^(m)	20,000	26,000	54,000	4,000	750	160	R or S ^(m)	0-500	(R-86 S-72 V-72)	2	8	—	(F-18.00-26 R-7.50-15)	10	10	25	—		
29	SOUTHWEST	VP-11	8,000	—	25,300	2,300	—	105	95	—	300	84	6	5	1	7.50-15	6	35	55	4	
30	TAMPO	SP-9-S	6,200	12,340	18,100	2,000	750	100	91 ^(a)	183 ^(a)	263 ^(a)	72	4	5	1/2	7.50-15	4	20	35	6	
31		SP-11-S	8,200	15,700	22,600	2,050	900	120	110 ^(a)	247 ^(a)	293 ^(a)	88	5	6	1/2	7.50-15	6	20	55	—	
32		SP-900	15,000	22,000	28,000	3,110	815	109	332 ^(a)	422 ^(a)	500 ^(a)	64	4	5	1/2	7.50-15	10	20	100	—	
33		SP-1030	20,000	39,250	60,200	5,470	2,230	335	360 ^(a)	572 ^(a)	728 ^(a)	94	5	6	1/2	9.00-20	12	35	100	—	

* Lbs. per lineal inch of rolling width

(a) Available with Hercules diesel

(b) Two 34 x 30-in. rolls on front

(c) Combination TC and spring-loaded clutch

(d) Includes calcium chloride in tires

(e) Available with MM 445 engine

(f) Available with MM Util-D diesel (\$12,950)

(g) Available with diesel engine

(h) Variable (torque converter)

(i) Available with Cont. HD-260 diesel (\$11,200)

(k) Duo-Pactor: Combines pneumatic-tired and

steel-roll compaction. In listing, "R" means rubber-

tired roll, "S" means steel roll.

(m) Tri-Pactor: Same features as Duo-Pactor (k, above)

with added vibratory steel-wheel rolling.

(n) Available with MM 445 50-hp, 4-cyl, 206-cu.in. diesel

(o) Available with MM 5-Star 80-hp, 4-cyl, 336-cu.in. diesel

(p) Lbs. per lineal inch of tire contact width

(q) Available with TC

NA Specification not available from manufacturer

Construction Methods AND EQUIPMENT

Specs for Your Files

POWER TRAIN														DIMENSIONS, OVERALL, IN.						PRICE	
Make	Model	Gas or Diesel	Max. Brake HP	Rated RPM	No. of Cylinders	Displacement, Cu. In.	Fuel Tank Capacity, Gal.	No. of Forward Speeds	Range of Forward Speeds, MPH	No. of Reverse Speeds	Range of Reverse Speeds, MPH	Clutch Type	Steering Type	Length	Width	Height	Wheelbase	Ground Clearance	Outside Turning Radius	F.O.B. Factory, Standard Model	
Cont. (a)	F-226	G	73	2,000	6	236	40	3	0-20	3	0-20	TC	Hyd	150	69	91	120	11	221	\$ 5,790	1
Cummins	JN-6	D	130	2,500	6	401	60	4	0-16	4	0-16	TC	Hyd	224	90	117	174	16	321	20,235	2
Cont.	F-244	G	64	1,800	6	244	16	4	2-13	4	2-13	TC	Hyd	178	69	74	116	9 1/2	234	6,150	3
Cont.	F-244	G	64	1,800	6	244	16	4	2-13	4	2-13	TC	Hyd	177.5	69	74	116	9 1/2	234	6,720	4
Cont.	F-162	G	40	1,800	4	162	11	4	2-13	4	2-13	TC	Hyd	178	69	74	116	9 1/2	234	5,890	5
Cont.	F-162	G	40	1,800	4	162	11	4	2-13	4	2-13	Fric.	Hyd	178	69	74	116	9 1/2	234	5,250	6
Cont.	F-244	G	64	1,800	6	244	44	4	2-13	4	2-13	TC	Hyd	192	90 1/2	74	129	9 1/2	244	8,250	7
Cont.	F-244	G	64	1,800	6	244	44	4	2-13	4	2-13	TC	Hyd	192	100 1/2	74	129	9 1/2	252	8,450	8
Cont.	M-330	G	83	1,800	6	330	28	4	2-15	4	2-15	(a)	Hyd	228	96	100	160	12	296	12,200	9
Cont.	TD-427	D	114	1,800	6	427	43	5	2-14	5	2-14	TC	Hyd	252	91	112	176	14	320	21,130	10
Cont.	F-226	G	73	2,400	6	226	35	3	0-15	3	0-15	TC	Hyd	150	68	88	120	11	226	N.A.	11
Cummins	JN-6P	D	125	2,500	6	401	50	3	0-20	3	0-20	TC	Hyd	224	80	121	174	15 1/2	318	N.A.	12
Cont.	F-226	G	50	2,200	6	226	16	4	2-20	4	2-20	TC	Hyd	158	66	83	128	10	15	6,150	13
Oliver	S-660	G	37	2,000	4	144	15	6	2.5-4.5	2	2.5-4.5	Fric.	Hyd	150	68	90	120	10 1/2	180	5,150	14
Oliver	S-770 (a)	G	52	2,000	6	216	15	8	2.5-4.5	8	2.5-4.5	TC	Hyd	154	83	91	124	10	216	6,750	15
M-M	Unit. (b)	G	57	1,300	4	283.7	21	6	2-14.5	6	2-14.5	Fric.	Hyd	172	96	87	136	11	276	11,550	16
BHC	UB-220	G	80	—	6	220	25	4	0.75-16	4	0.75-16	Fric.-TC	Hyd	150	69	96	120	11	221	N.A.	17
Cont.	F-226	G	50	1,800	6	226	30	5	2.5-13	5	2.5-13	Fluid	Hyd	162	68	72	90	13	182	N.A.	18
Cont.	TD-427	D	100	1,800	6	427	70	4	2.5-12	4	2.5-12	TC	Hyd	19'	71 1/2'	11'	136	12	280	N.A.	19
Oliver (a)	66	G	38	2,000	4	144	13	(b)	0-14	(b)	0-14	TC	Hyd	151	69 1/2	92	121	10	228	5,975	20
Oliver (a)	66	G	38	2,000	4	144	13	5	2.6-7.8	2	4.1-6.8	Fric.	Hyd	151	69 1/2	92	121	10	228	5,075	21
Ford (a)	223	G	78	2,000	6	223	34	(b)	0-30	(b)	0-30	TC	Hyd	149	69 1/2	90	119	10	228	6,400	22
Cont. (c)	FA-226	G	75	2,600	6	226	40	6	1-20	2	2-9	TC	Hyd	211	92	71	132	11	220	10,200	23
H (a)	460	D	50	1,800	6	236	80	10	1.8-18.0	2	2.0-5.0	Disc	Hyd	286	86	81	128	10	148	11,750	24
H (a)	650	D	88	2,000	4	350	80	5	2.5-20	1	2.0-4.0	Disc	Hyd	288	86	83	134	10	148	16,000	25
H-H (a)	650	D	88	2,000	4	350	50	5	2.5-20	1	2.0-4.0	Disc	Hyd	297	95	83	148	12	162	17,500	26
H-H (a)	460	D	50	1,800	6	236	80	10	1.8-18.0	2	2.0-5.0	Disc	Hyd	286	86	81	128	10	148	15,000	27
H-H (a)	650	D	88	2,000	4	350	80	5	2.5-20	1	2.0-4.0	Disc	Hyd	288	86	83	134	10	148	20,000	28
Cont. (a)	F-162	G	40	2,000	4	162	25	4	0-15	4	0-15	TC	Hyd	157	84	78	127	10	264	N.A.	29
Oliver (a)	660	G	42	2,000	4	155	10	5	2.5-12	2	2.5-4.5	Fric. (a)	Hyd	154	72	88	124	10	240	5,050	30
Oliver (a)	680	G	65	2,200	6	265	20	6	0-20	6	0-20	TC	Hyd	155	86	92	127	10	240	7,385	31
Oliver (a)	680	G	65	2,200	6	265	20	6	0-20	6	0-20	TC	Hyd	166	64	93	138	10	288	9,150	32
Oliver (a)	Twin 680	G	130	2,200	12	530	40	5	0-17	5	0-17	TC	Hyd	212	94	97	172	10	324	19,500	33

Bros Inc., 1057 10th Ave., S.E., Minneapolis 14, Minn.
 Browning Mfg. Co., 1111 Humble Ave., San Antonio 6, Texas.
 Buffalo Springfield Roller Co., Springfield, Ohio.
 Chester Products Inc., Belle Ave. & B & O R.R., Hamilton, Ohio.
 Ferguson rollers: Shovel Supply Co., 4300 Hines Blvd., Dallas, Texas.
 Galion Iron Works, Galion, Ohio.
 W. E. Grace Mfg. Co., 6000 S. Lamar St., Dallas 15, Texas.
 Rosco Mfg. Co., 3118 Snelling Ave., So., Minneapolis 6, Minn.
 Seaman-Andrews Corp., Elm Grove 4, Wis.
 Seaman-Gunnison Corp., 2763 S. 27th St., Milwaukee 15, Wis.
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Regardless of bag capacity, dump trucks are yours with GMC's conventional and L-Box design, four- and six-wheelers with proved gas or diesel power.

This GMC pickup is just one of over thirty different capacity, body and wheelbase combinations. Choice of 8hp. or V-8 power, 4-wheel drive or Power-Lok.



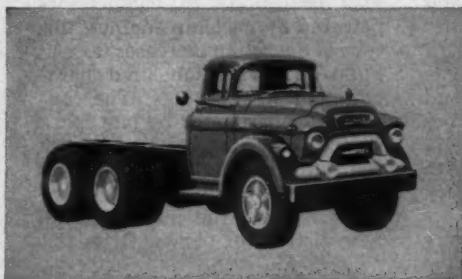
Lower axle is GVW additional standard engine, r

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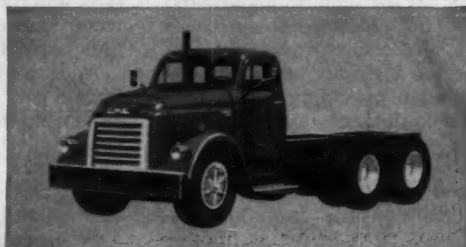
GMC Operation "High Gear" brings you construction trucks with the lowest prices, biggest loads, most economical power and longest engine life!

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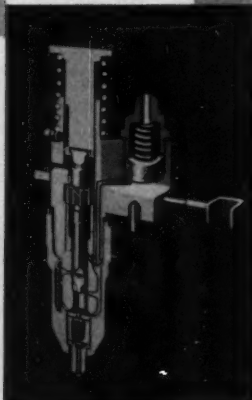
Lowest prices—This GMC 450 with tandem rear axle is the lowest-priced six-wheeler in the 35,000 lb. GVW class . . . saves you several hundred dollars. In addition, you get plus-value features throughout as standard equipment—proved, heavy-duty 6-cylinder engine, rugged frame and 7,000 lbs. capacity front axle.



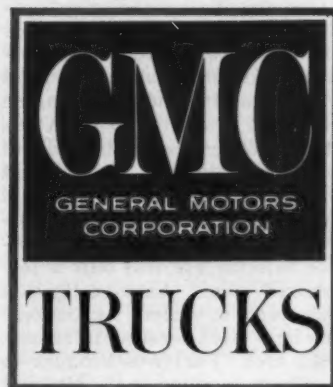
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Longest engine life—All GMCs are true-truck built, made to last. Engines with M-400 bearings that have 7 times longer life, rifle-drilled connecting rods assure positive lubrication. Cabs are sturdily reinforced for lasting service on the most rugged jobs.



Most economical power—This is the heart of the fuel system. GMC injectors that meter, time, inject and atomize the fuel. These, plus many other GMC "exclusives", make GMC 2-cycle diesel engines the most economical you can get.



From ½-ton to 45-ton . . . General Motors leads the way!

About the Author
RALPH VOGGENTHALER is
engineer-in-charge of portable compressors
at Ingersoll-Rand. He has been
with the company for 25 years.



*An expert tells how to
cut down on major overhauls*

COMPRESSORS

PROVIDING clean air, clean lubricants, and clean fuel is the most profitable way for rotary compressor owners to spend their maintenance dollars. These are the items that make it possible to stretch out the time between overhauls and confine major overhauls to the off-season.

Every operator is well aware that downtime is expensive, but many are reluctant to do the simple things that will minimize it. They themselves breathe dusty air, eat lunches that are sometimes gritty, drink water from a dusty dipper, and thrive on it. It is difficult for them to understand why their equipment sometimes rebels at the same treatment. Because the operator often is careless about providing clean food for his equipment, it may be profitable to review what constitutes good practice.

Good maintenance practice can lengthen the time between overhauls by a factor as high as 10 to 1. The reasons for this wide spread are not mysteries, but they point out why clean air, clean lubricants, and clean fuel are so important.

What Not to Do

One classic example, in my experience, of extreme carelessness on the part of the operator concerns a complaint about the need for overhauling the diesel engine on a rotary portable twice in less than 3,000 hours. It turned out that the complaint was correct and that actually a third overhaul would soon be necessary. The operator complained that the engine injector life was only a few hundred hours. An investigation uncovered a variety of reasons. The unit was operating in an isolated area. Fuel was brought to it in barrels rolled to the site and

transferred to the portable tanks by a hand pump. The pump also was used to transfer any make-up water required by the radiator. When not in use it lay on the ground near by. Obviously the water and dirt added by the pump was responsible for at least part of the short life.

We also found that lubricating oil came from an uncapped 5-gal can on the drilling site. At the main supply base the fuel storage tank filler pipe was sometimes capped with a flat rock, and sometimes left entirely open. Fuel was drawn from the bottom of the tank and included all the dust and water that entered the open filler plus normal condensation.

An examination of the downstream side of the compressor and engine air cleaners revealed heavy deposits of abrasive dust. Both air cleaner pans were filled with sludge and obviously had not been cleaned in many days.

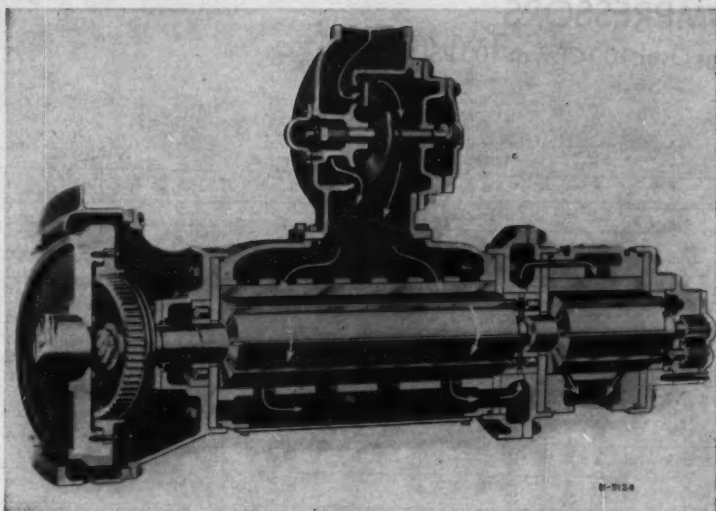
When all these items were

pointed out to the operator, his only comment was that construction equipment can't be operated in a parlor. He finally achieved satisfactory service life between overhauls but only after repeated emphasis on clean air, clean lubricants, and clean fuel.

Regular service should also include a periodic engine tune-up. Most operators will have their automobile engine tuned at 10,000-mi intervals, but few realize that this is equivalent to less than 300 hr of portable operation. Many portable compressors run hour after hour at a no load or part load condition. In compressors powered by gasoline engines, this type of operation increases deposit build-up in the combustion chambers and on the plugs. The condition is aggravated by late spark timing. Therefore, it pays to check the timing at the end of the first 100 hr of operation of a new engine, or after the installation of new distributor points. After this



ENGINE HAZARD—Compressors often have to work in a dusty atmosphere. This makes it especially important to make sure that the air going into the machine is clean.



PRECISION MACHINE—White arrows on diagram of typical rotary compressor show path of air through moving parts of machine. If air carries dust, it can ruin these parts.

initial check, make rechecks at intervals recommended by the engine manufacturer.

The 100-hr check should include a relashing of the engine valves. There have been many cases of burned valves because the operator failed to compensate for the more rapid change in settings that takes place during the initial period of operation. Late timing and combustion chamber deposits also accelerate valve stem growth. Therefore, this early tune-up is vital in preventing non-scheduled repairs.

Lubrication

The compressor and engine oil should be changed as recommended by the manufacturer. Generally, a quality turbine type oil works best in rotary compressors.

Most turbine type oils contain rust and oxidation inhibitors. The oxidation inhibitor is needed to prevent varnish and lacquer-like deposits in the oil cooler and throughout the system. Some automotive oils contain these inhibitors, but they often contain a type designed to prevent oxidation at higher engine temperatures, and they may not be effective at rotary compressor operating temperatures.

Turbine type oils do not contain detergents, and in most operating conditions they are not needed. When operating at a prolonged light load in high humidity localities, detergents may pick up

moisture. The dimensional stability of the vane material is sometimes affected, thereby inhibiting free vane motion in the rotor slots.

Regular servicing also should include cleaning the unit externally. Dust accumulations, particularly on the oil cooler and radiator surfaces, should be blown off to prevent heavy deposits from building up. In dusty atmospheres and in hot weather this may have to be done every shift.

The engine fan belts should be checked regularly for proper tension to prevent slippage. Rotary portables are designed to operate without overheating, but in hot weather the operator must assist by keeping the cooling surfaces clean and the fan belts tight.

It should be unnecessary to emphasize that filter elements must be serviced as recommended, but it is surprising how often this job is neglected. On compressors, the engines are equipped with throw-away-type oil filter elements while the compressor itself uses a full-flow cleanable filter.

Throw-away elements are designed to remove the fine carbonaceous and wear particles from fuels and oils circulated through closely fitted parts at limited flow rates. The cleanable type filter serves a flood lubricated system in which a high rate of oil circulation is maintained. If the air cleaner is serviced regularly, the duty of the oil filter is light. How-

ever, regular inspection is the only effective way of guarding against sludge and lacquer formations. These deposits, caused by the use of the wrong oil or the correct oil used too long, are readily detected in the filter. Removing them in time will prevent the need for a general cleaning.

Oil separators and receiver combinations, as used in rotary compressors, vary from a single tank to the more complicated three-tank system. The function of these various arrangements is identical. One part is used for oil storage, a second for primary oil separation, and a third for secondary or final oil separation. Normally no servicing of the separating system is necessary except at major overhaul periods.

Two methods are used for returning the oil removed by the secondary separator. In one arrangement, a small scavenging pump returns the oil directly to the oil storage section; the second method employs a bleed through an orifice to a lower pressure section in the compressor. If oil consumption becomes abnormal, the scavenging system should first be examined because a plugged protecting screen or a plugged orifice will increase oil consumption as readily as a defective separator element.

It Makes Sense

This maintenance program is sensible, practical, and profitable. It will keep the portable on the job and working. By following it, major overhaul periods will be relatively infrequent and in most cases can be scheduled. In general, major overhaul periods for the compressor will be governed by engine requirements, and any compressor work can be done while the engine is being rebuilt.

A compressor tear-down for inspection, compared with an engine overhaul, is a short job. Usually all that is needed is a set of vanes. In a two stage compressor replace the high pressure vanes at 4,000-hr intervals and low pressure vane at 8,000 hr. These periods represent two years and four years operation respectively for the average portable. The engine compressor can be removed, torn down, inspected, rebuilt, and put back in operation in a day so it is cheap insurance to do a complete job.

PORTABLE COMPRESSORS

With Air Delivery Ratings Over 100 CFM at 100 PSI

PORTABLE COMPRESSORS

With Air Delivery Ratings Over 100 CFM at 100 PSI



MAKE AND MODEL	COMPRESSOR										ENGINE										DIMENSIONS - FOUR-WHEEL MOUNTING										MOUNTING																																																																																																																																																																																																																																																																																																																																															
	Type	No. of stages	No. high pressure cyl.—down & stroke	No. low pressure cyl.—down & stroke	Full load RPM	Air tank capacity, cu. ft.	Maximum pressure, psi.	No. of filters	Type of filters	Type cooling system	Crankcase oil, qts.	Make, gas engine	No. of cylinders, gas engine	Make, diesel engine	Model, diesel engine	Rated horsepower, diesel engine	Rated tank capacity, gal.	Length, in.	Height, in.	Width, in.	Working weight, lbs.	Length, in.	Height, in.	Width, in.	Working weight, lbs.	Length, in.	Height, in.	Width, in.	Working weight, lbs.	Length, in.		Height, in.	Width, in.	Working weight, lbs.	Length, in.	Height, in.	Width, in.	Working weight, lbs.	Length, in.	Height, in.	Width, in.	Working weight, lbs.	Length, in.	Height, in.	Width, in.	Working weight, lbs.	Length, in.	Height, in.	Width, in.	Working weight, lbs.	Length, in.	Height, in.	Width, in.	Working weight, lbs.	Length, in.	Height, in.	Width, in.	Working weight, lbs.	Length, in.	Height, in.	Width, in.	Working weight, lbs.	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Ingersoll-Rand Co., 11 Broadway, New York 4, N.Y.
Jager Machine Co., 591 W. Spring St., Columbus 16, Ohio
Joy Manufacturing Co., Michigan City, Ind.
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O.R.C. Div., Westinghouse Air Brake Co., Milwaukee 1, Wis.
O.K. Div., John C. Mather Printing Press Co., Columbia, Pa.
Soram, Inc., West Chester, Pa.
Gordon Smith & Co., 440 College St., Bowling Green, Ky.
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 Gordon Smith & Co., 440 College St., Bowling Green, Ky.
 Worthington Com. Div., Worthington Corp., Holyoke, Mass.

(a) Dimensions on Two-Wheel Trailer

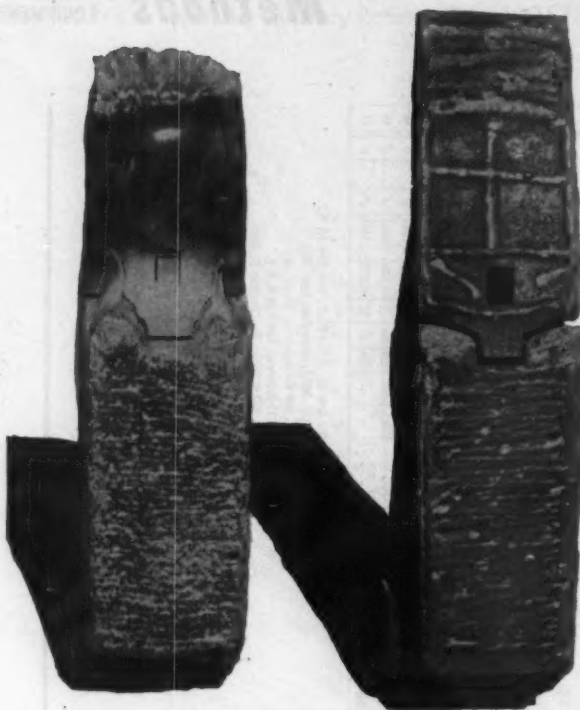
(c) Tacheometer combination

(c) Piston type supercharged with Rotary

(f) " " " " with 120 HP Cummins

[illegible]

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ROAD RIPPER TEETH averaged 7 to 10 times more life after receiving protection with Tube Borium. Notice how tooth chisels down with wear.



SHOVEL TEETH wore out in one 8-hour shift. A few beads of Tube Borium applied during noon break prolong life 6 or 8 full shifts. They are then repointed and hard-faced for further use.

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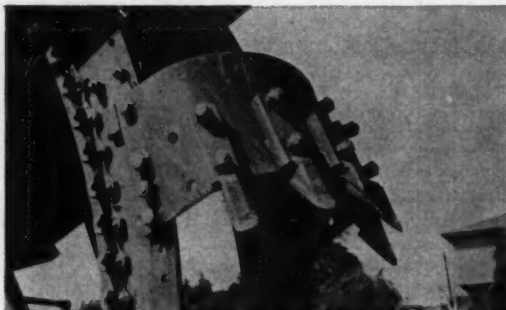
Why is this one hard-facing alloy so superior on teeth? No other hard metal equals **TUBE BORIUM** in straight abrasion resistance. Its deposits are thickly peppered with tiny tungsten carbide particles. Wear is virtually defied by this hardest-of all man-made metals.

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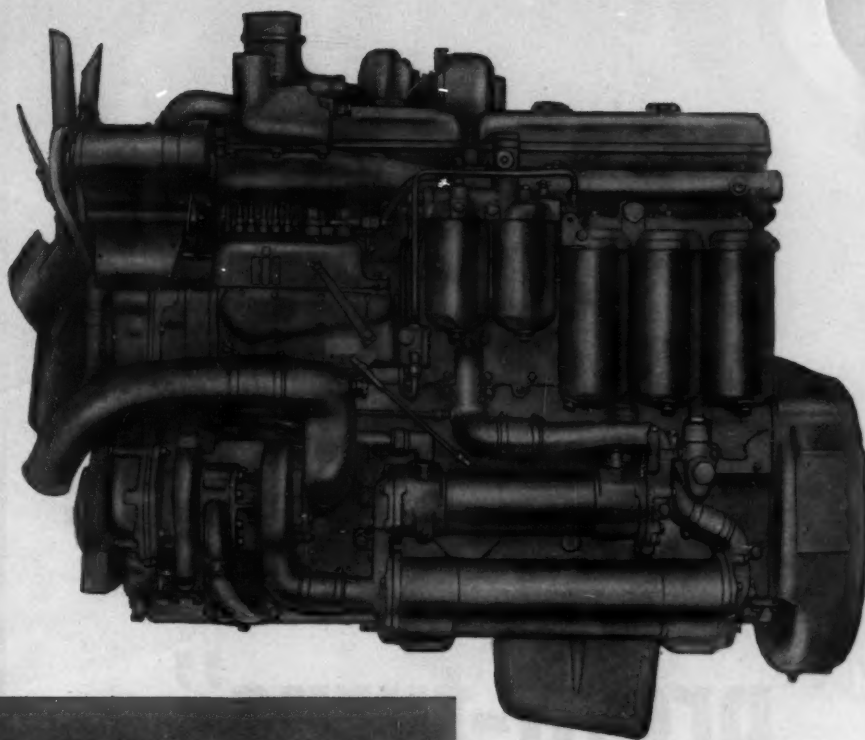
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DRAO LINE TEETH used in slag dump were hard-faced with Electric Tube Borium—outlasted unprotected teeth 9 to 12 times.



DITCHER TEETH—A few ounces of 30-40 Electric Tube Borium on points of teeth increased life 6 to 8 times over factory originals.



NEW UDT-817 DIESEL is a 4-cycle turbocharged engine with 817 cu. in. displacement and max. torque of 1,040 lbs. ft. @ 1,400 rpm.

New power, performance and price leader in the 385-hp diesel class

Here are three fast facts about the turbocharged, new direct-start, direct-injection International 6-cylinder UDT-817 diesel that can mean big savings on your construction equipment:

POWER—The UDT-817, developing 385 hp., leads the field in its size class.

PERFORMANCE—The specific fuel consumption of the UDT-817 is the lowest in its size class.

PRICE—The UDT-817 is the lowest priced engine in its size class in dollars per horsepower.

A wide variety of accessory equipment including air cleaners, flywheels for leading makes of torque converters and clutches, torque converter cooler, air control compressors, safety shut-offs, instruments and engine controls can be furnished to meet your installation requirements. Base, radiator, hood and dash, clutch and power take-off are available for complete power units.

The new 250-hp. D-817 is the naturally aspirated version of this same basic diesel engine. Your nearby International Power Unit Distributor or Dealer can give you full details of either new model or on the 30 other diesel and carbureted construction equipment engines in his line. All 32 engines have one common feature—fastest payback power for users.



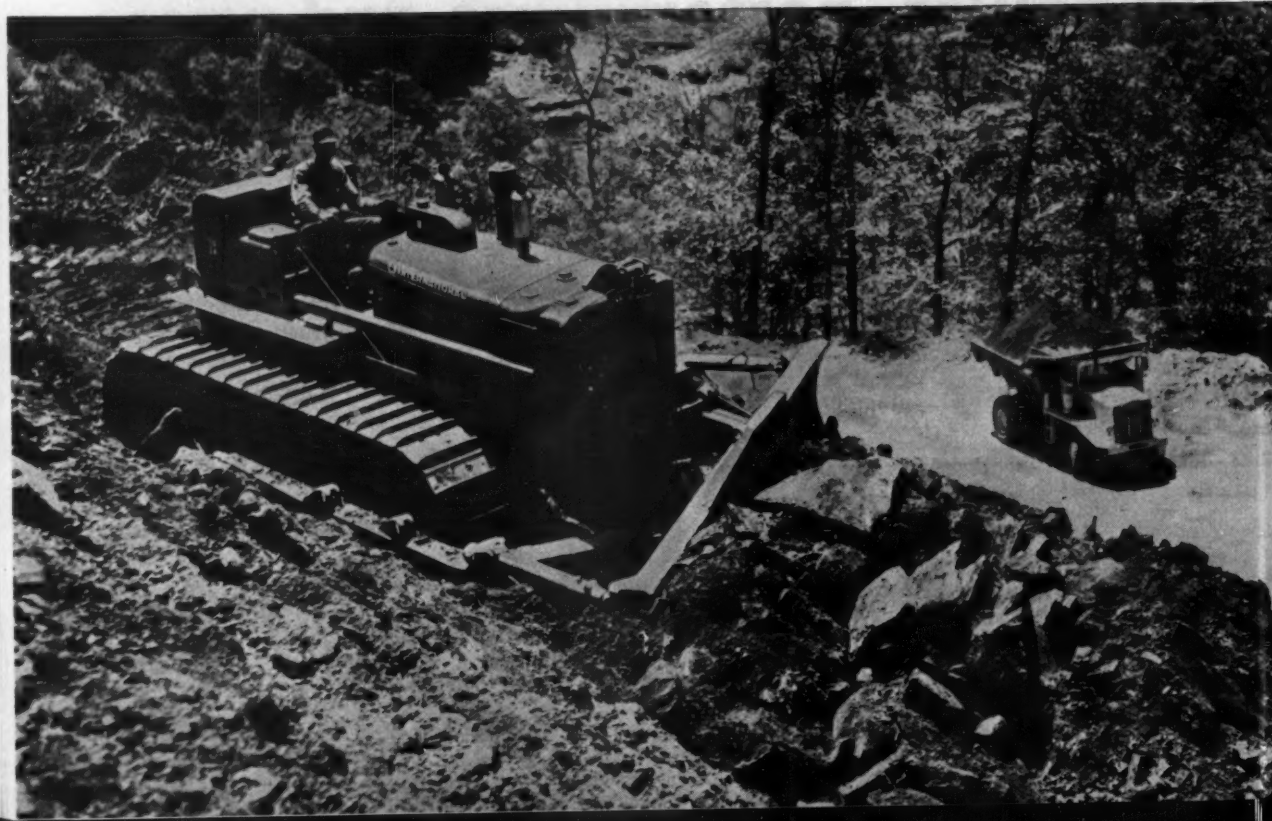
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**How TD-24's
give you bigger
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with full-time "live tracks"



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Planet-Power steering!

Often your International TD-24 operators can hand you an enormous paydirt dividend—as big as 40%—compared to other big crawlers that “half kill” their power on turns. The big difference: exclusive, years-proven TD-24 Planet-Power steering!

Planet-Power steering gives you full-time “live” power on both TD-24 tracks—full-time separate and positive control of each track! And full-time on-the-go power-shifting!

“Dead-track drag” is eliminated

Blading ‘round curves, benching, bank-cutting or side-casting, the TD-24’s dozer keeps cutting—keeps paydirt on the move—doesn’t spill your extra-profit margin. Both tracks keep pulling. Load-limiting “dead-track drag” is eliminated. You get full-bite, full-blade performance where other rigs only “nibble”!

Bank-nosing, rear-end slueing, are eliminated without loss of speed or action! TD-24 operator simply operates the load-side track in high speed range while keeping the outside track in low range. Result: full-capacity, straight-ahead performance, despite the big offset load! Owner J. C. Critcher, Asheville, North Carolina, reports: “TD-24 planetary Hi-Lo steering keeps the blade digging more yardage in less time, with minimum side slip.”

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers and Bottom-Dump Wagons... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.

Even blading shot-rock ‘round the “corner”—where clutch-steered king-sized crawlers so often spill the “pay” part of the load—the International TD-24 makes full-profit passes! View shows one of two TD-24’s at work on U.S. 60 north of Globe, Arizona, for Flickinger Bros. Contracting Co.

Hi-Lo power-shifting, too!

And Planet-Power steering gives you famous Hi-Lo range power-shifting. You instantly adjust speed to the load without stopping or declutching, going forward or in reverse, simply by flicking steering levers into the proper range—with 2-finger ease. You clip vital minutes from shuttle-dozing cycles!

At the end of the pass, simply press the TD-24’s decelerator for quick-shifting to fast reverse; zip back for another full-blade pass. Hi-Lo planetary levers give two separate speeds in any forward or reverse gear selected!

Prove what it means in profits to get Planet-Power steering paydirt dividends of up to 50%. Discover the satisfaction of beating anything else on tracks—with fingertip ease. See your International Construction Equipment Distributor for a TD-24 demonstration!



**International[®]
Construction
Equipment**

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

NOW...a year later...same still leads in availability ...with 96.1% working record

—for Southern California Edison Co.,
Los Angeles, Calif.

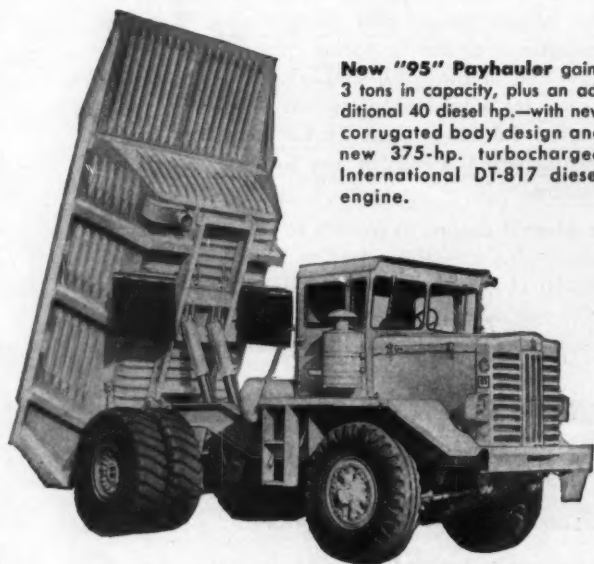


A year later, in 1959, still meeting and beating machine-mauling High Sierra rock-hauling conditions—on Mammoth Pool Hydroelectric Project, for Southern California Edison—the same 10-unit International 95 Payhauler fleet is still turning in this excellent record of availability.

With 2,500 to 2,700 working hours clocked on each unit of the fleet, the 10 Payhaulers delivered 96.1 availability in a recent measured month. The Payhauler fleet never lost a day due to mechanical failure! Performance like this has helped advance job-completion date substantially ahead of schedule!

Southern California Edison Company credits their excellent results partly to strong-built, easy-to-maintain machines—partly to a methodical preventive maintenance program. Working view shows two Payhauler units highballing rock fill to the dam site in 1959—maintaining record high availability!

...NEW corrugated-body Payhauler models



New "95" Payhauler gains 3 tons in capacity, plus an additional 40 diesel hp.—with new corrugated body design and new 375-hp. turbocharged International DT-817 diesel engine.

See those exclusive, rock-ribbed body corrugations! International applies this exclusive strength-multiplying principle to reduce the body-weight of new Payhauler models with these results:

- New "95" Payhauler loses 2½ tons of power-wasting dead-weight; gives 3 extra tons of payload capacity!
- New "65" Payhauler sheds 5,000 pounds of useless "ballast"; gains a whole ton of new hauling capacity!

And both these weight-streamlined Payhaulers have new International diesel power to highball the bigger payloads 14% faster than the previous models. These new Payhauler models have the power-to-weight ratio to out-cycle even lower capacity rigs.

Get the proof that new Payhauler models can deliver and keep delivering you the lowest material-moving costs in the off-highway hauling market. See your International Construction Equipment Distributor for a demonstration!

95" Payhauler[®] fleet



speed bigger loads...up to 14% faster!



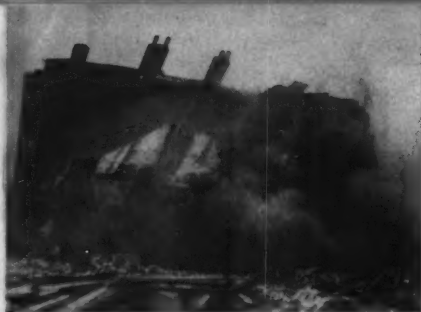
New "65" Payhauler, the only 19-tonner, features International's exclusive new corrugated body principle. Powered by the naturally aspirated new 250-hp. International D-817 diesel engine.



***International[®]
Construction
Equipment***

International Harvester Co.
180 N. Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers and Bottom-Dump Wagons... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.



TD-24 king-sized drawbar pull cables down a building.

TD-15 Four-in-One keeps 17 trucks "cycling".

on slum clearance project!

Mass-production clearance of slum area buildings, at minimum cost, is a profitable reality—for Richard E. Harder Contracting Company, St. Louis, Missouri.

The contractor cables the old buildings down with an International TD-24—mauls them to bits with cranes and the "24." Then he "turns" the International Drott TD-15 Four-in-One loose on them—and the debris-loaded trucks (17 of them) start "cycling!"

Harder Contracting Company began loading out with a Skid-Shovel bucket—soon switched to the 4-in-1 to get capacity-boosting, money-saving multi-machine utility! Now the TD-15 Four-in-One, under one-man control, doubles for a whole spread of "big-ticket" rigs!

It gets 115 heavy-duty hp. from its smooth-running 6-cylinder diesel engine—to "push home" the bucket in "solidified" debris. It's got 39,200 lbs. of pry-over-shoe break-out action to excavate "anchored" materials. And the operator simply moves the "machine-selector" lever to also get clamshell action to "clamp" on to hard-to-handle, wood-and-masonry debris—plus versatile dozer and "carry-type scraper" performance!



Then the TD-15 "horses" in and heaps bucket.

See what it means in profit-earning capacity to switch machine actions instead of machines—to handle materials and conditions that frustrate old-style "single-action" rigs! Prove that exclusive, shock-swallowing Hydro-Spring adds operating comfort—prolongs equipment life. See your International Drott Distributor for a 4-in-1 demonstration!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin



INTERNATIONAL DROTT



Exclusive 4-in-1 clamshell bottom-dumping, quickly heap-loads a big truck. Fast TD-15 Shuttle-Bar forward-reverse control speeds 4-in-1 loading cycles!

About the Author



EUGENE T. WARD is liaison man between the Sales, Service, and Engineering Departments of the Cleveland Trencher Co.

Careful maintenance of the digging wheel will boost production.

TRENCHERS

THE WHEEL END or digging half of a trencher requires special attention during maintenance checkups. The other end or front half of the trencher consists of the engine, clutches, transmissions, differentials, brakes, hydraulic power control system, and crawler tracks. These components and the various power transmission lines present no special maintenance problem, and the procedures used for most crawler tractors apply.

Boom and Wheel Assembly

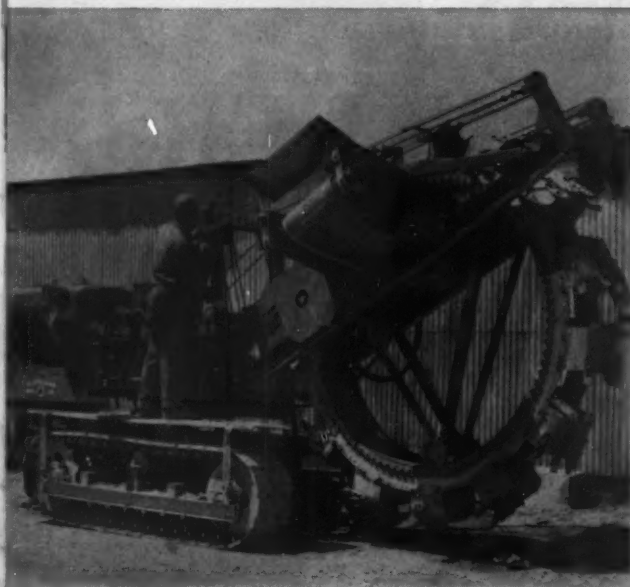
The digging wheel is mounted on the boom. The front end of the boom slides up and down on a mast and is supported by four cables, two fore and two aft. The mast rails should have some grease on them at all times. Each pair of cables must be equal in length for the boom to hang properly. This can be accomplished by properly adjusting the turnbuckles.

The digging wheel is supported in the boom at three points, two upper and one lower. These supports consist of flanged rollers mounted on anti-friction bearings. They require greasing daily.

The two upper supports are adjustable laterally to accommodate the various widths of digging wheels that are available for most trenchers. For this reason, care should be taken when adjusting these upper trucks. They should be adjusted so that the digging wheel is in the center of the boom. The distance between the flanges should be $\frac{1}{8}$ in. greater than the width across the digging wheel. There is no lateral adjustment in the lower support.

With the digging wheel supported in this manner, it rotates without interfering with the conveyor and other crossmembers in





BOOM CABLES—Workman checks adjustment of front boom cables. Cables must be equal in length for boom to hang properly.



CONVEYOR—Definite sag on underside of conveyor belt shows it is not too tight. Adjusting end pulleys corrects belt tension.

the boom. The rotating force is transmitted to the digging wheel rims through two driving sprockets that mesh with the lugs on the segments riveted to the digging rims.

On some units, these sprockets have a round bearing surface and actually are the rollers of the front upper support. On other units, these sprockets are mounted on a separate shaft. In either case, the important thing in adjusting the position of this shaft is that the lugs on the rims do not bottom in the sprockets. On units where the digging wheel is supported by these sprockets, they should be checked periodically for wear and should be replaced before the lugs bottom or serious damage may result. Sprockets should also be replaced if they are wearing unevenly.

Drive Shaft Assembly

The shaft on which the driving sprockets are mounted is called the digging wheel drive shaft. The bearings which support this shaft should be greased daily. The sprockets are split and bolted to hubs on the shaft for easy replacement. Failure to adjust these sprockets properly or to replace them when necessary can result in costly replacement of the segments on the digging wheel.

The final adjustment of the digging wheel can now be accomplished at the lower support. This support or lower truck is held in place by four stay rods that extend down from the boom. Getting this lower truck in position is done by adjusting the length of the stay rods. With the boom raised so that the digging wheel is resting on the two upper supports and not touching the ground, the length of the stay rods should be adjusted so that the digging wheel is square with the boom and there is about $\frac{1}{8}$ in. clearance between the lower support rollers and the digging rims.

The rollers on the lower truck and the rear upper truck should be periodically checked for wear and replaced before the flanges begin rolling on the segment lugs.

Buckets, Backs, and Tips

The buckets on a wheel-type trencher are usually bolted to the digging rims. These bolts must be tight. Most trenchers have what is known as a two or three bucket roter pattern. This refers to the placement pattern of the rooters that hold the replaceable tips. On a two-bucket pattern, every other bucket will have the same pattern. On a three-bucket pattern, every third bucket is the same. This is most important for

efficient digging, as each bucket must do its share by cutting in between the tips on the previous bucket.

Any mixup in this bucket pattern can throw the digging wheel off balance, and the result will be loss of production and excessive wear on the driving mechanism. It is most important when replacing buckets, to use a bucket with the identical roter pattern as the one removed.

The rooters on the sides of the buckets usually extend out about $2\frac{1}{2}$ to 3 in. beyond the side of the buckets. These rooters, together with the width of the buckets, determine the width of the trench being dug. They cut the trench wide enough to provide clearance for the segments on the digging wheel. Spacers can be added between these rooters and the buckets to gain another few inches in width, or straight shanks may be installed for a narrower cut. The important thing in changing side rooters is that they must be extended far enough to cut clearance for the segments. When these rooters are extended outward, slowdown in forward speed will result.

The condition of the digging tips is most important to the efficiency of the trenching operation. Worn out tips will result in slower production and accelerated



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buy



Here's why you can produce **MORE** low-cost aggregate with Cedarapids

✓ **CHOICE OF COMPONENTS**—In the complete Cedarapids line there are 8 sizes of Single and Double Impeller Impact Breakers; 18 sizes of single and twin jaw crushers; 6 sizes of roll crushers; 3 sizes of hammermills; 10 sizes of horizontal vibrating screens, with single, double or triple decks.

✓ **CAPACITY-BOOSTING AUXILIARY EQUIPMENT**—Vibrating grizzlies; washing plants; washing attachments; feeders; conveyors; bins.

✓ **BALANCED PRODUCTION**—Each Cedarapids component you need is recommended not only as to the type that best handles your quarry conditions, but also to match every other component in the plant for balanced output. Only Cedarapids has the complete line of components to make this possible!

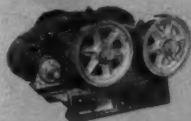
✓ **SKILLED ENGINEERING**—Cedarapids engineers have been analysing and solving problems similar to yours for 36 years. Put their production-wise experience to work for you now!

Cedarapids "tailors" each stationary plant to each job requirement

Your aggregate producing problem is different from any other in the world. That's why Cedarapids maintains a special engineering department to "tailor" your stationary plant to your particular job for the most profitable production. Take advantage of Cedarapids engineers' field experience, their intimate knowledge of rock and salable rock products, their skill in combining the right components to give you extra tons per hour while saving money on lower maintenance and reduced operating costs. Call in a Cedarapids engineer *before* you plan your plant. Ask your Cedarapids Dealer for details.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.

THE RIGHT COMPONENTS, PRODUCTION BALANCED
FOR EACH JOB, ASSURE HIGHER PROFIT . . .



Twin-Jaw Crushers, exclusive with Cedarapids, increase crushing capacity from 40% to 100% over comparable-size single jaw crushers.



Cedarapids Roll Crushers assure high capacities of small sized aggregate at lowest cost per ton.



Cedarapids Horizontal Vibrating Screens have 12% greater screening area than same-length inclined screens; give 20 to 30% more effective gradation.

wear on the whole power train. The money saved in tips is spent in fuel and repair costs.

Spoil Conveyor

The conveyor is mounted on the boom and extends through the digging wheel. It may be driven hydraulically or mechanically. In either case, the correct conveyor belt tension can be obtained by adjusting the end pulleys in or out. As a general rule the belt should be somewhat loose, with a definite sag on the underside of the conveyor. A belt that is tight will wear out faster than necessary.

The side belts keep dirt and sand from inside the conveyor. If, because of wear or bent supports, they do not contact the conveyor, they should be replaced or the supports corrected before more serious damage results.

Chains, Sprockets, and Idlers

The various chains used on trenching machines should give long trouble-free service. They

should be oiled daily with a light motor oil. It is usually better to apply the oil to the inside of the chain so that it can work its way outward into the rollers.

The sprockets and chain should be checked periodically for alignment and excessive wear. Wear on a sprocket may change its pitch diameter, causing the chains to jump. The same is true of a worn chain.

What usually happens, however, is that the chain and sprockets wear about the same and no trouble develops until a new chain is installed on the old sprockets. For this reason, it is advisable to check the wear on the sprockets and consider replacing them when replacing the chain.

Some chain drives on trenchers have spring-loaded take-up arms to compensate for constantly changing length. There are two idler sprockets on each take-up arm. The bearings in these sprockets should be oiled or greased daily as specified. In ad-

dition, they should be given a daily visual check for alignment, and the chain should be lifted free of each idler sprocket and the sprocket rotated by hand to make sure it is not binding. These idler sprockets have a tendency to wear out faster than the driving sprockets. If not replaced, worn idler sprockets will accelerate chain wear.

Crumbing Shoe

The crumbing shoe is mounted on the rear of the boom and extends down to the bottom of the trench while the unit is digging. It cleans the trench, forms the bottom, supports the back end of the boom, and helps maintain grade. The crumbing shoe should be adjusted so that the cutters on the buckets, when rotated, will miss its lower front toe by about 2 in. When this 2-in. adjustment is set, the bottom plate should be adjusted so that about 1 to 2 in. of the bucket tip is visible in a line of sight along the bottom.



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- 100% drop forged . . . heat treated
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Buy Genuine Crosby-Laughlin
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Work
Silva
DW-21
3,500
golf
units

Lubric
(left)

ENGINEER'S FIELD REPORT

PRODUCT **RPM DELO OIL**

FIRM **Silva & Hill Construction Co.
Los Angeles, Calif.**

5,000 hours at 2,000 rpm before overhaul



Working at 2,000 rpm speeds in heavy dust, Silva & Hill Construction Co. operates 8 Caterpillar DW-21s (like one above) five days a week removing 3,500,000 cu. yds. of dirt and rock for Burbank golf course. Firm reports RPM DELO OIL keeps these units rolling an average of 5,000 hours before

major overhaul. Says Maint. Supt. H. C. Basinger: "We've got 39 diesel-powered machines working to beat a one-year deadline. Any unexpected delay costs plenty. That's why we stick with 'DELO'. It's proved it will keep equipment rolling longer without engine breakdowns or repairs."



Lubricated with RPM DELO OIL, this Caterpillar D-8 Tractor (left) turned in 10,000 hours, bulldozing and pulling sheepsfoot rollers, before major overhaul. Frank W. Hill (right) Silva & Hill partner, reports: "We've used RPM DELO OIL in all our diesel units since 1940. It has really paid off in keeping our equipment in top running condition."



TRADEMARKS "RPM DELO" AND CHEVROLET DESIGN REG. U.S. PAT. OFF.

**STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey**

Why RPM DELO Oils reduce wear—prolong engine life

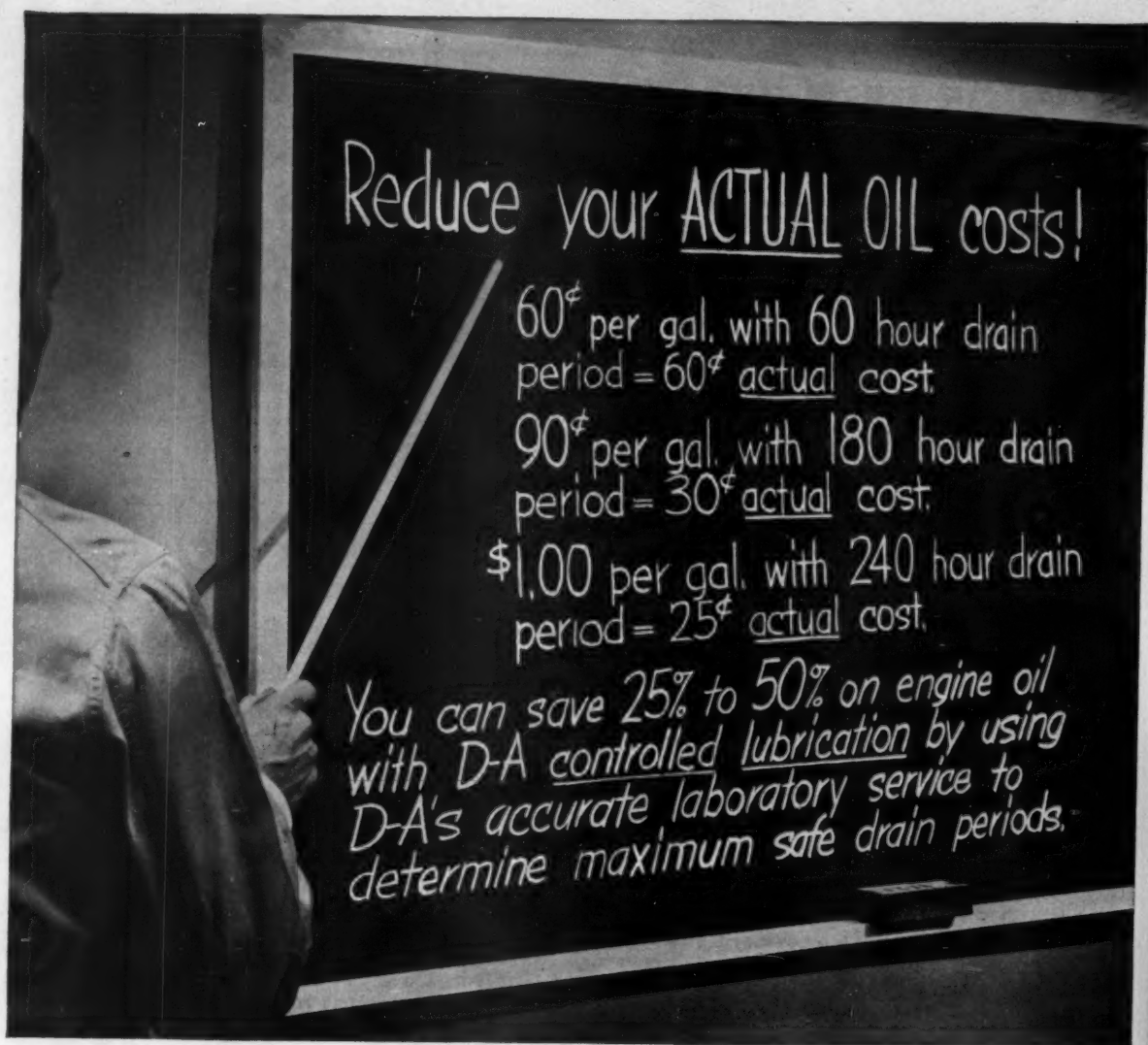
- Oil stays on engine parts—hot or cold, running or idle
- Anti-oxidant resists lacquer formation
- Detergent keeps parts clean
- Special compounds prevent corrosion of bearing metals
- Inhibitor resists crankcase foaming.



For More Information

or the name of your nearest distributor, write or call any of the companies below.

**STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA COMPANY, Denver 1, Colorado**



Reduce your ACTUAL OIL costs!

60¢ per gal. with 60 hour drain period = 60¢ actual cost.

90¢ per gal. with 180 hour drain period = 30¢ actual cost.

\$1.00 per gal. with 240 hour drain period = 25¢ actual cost.

You can save 25% to 50% on engine oil with D-A controlled lubrication by using D-A's accurate laboratory service to determine maximum safe drain periods.

Controlled lubrication means more hours of safe operation for each lubrication dollar. With D-A "Extra-Treated" Diesel Oil you can greatly extend your drain periods . . . up to 400% . . . and save on both oil costs and equipment maintenance. D-A "Extra-Treated" Diesel Oil offers these advantages: high, natural viscosity index for added protection against wear; more and better additives to prevent additive starvation and to hold harmful wastes in sus-

pension; neutralization of acid corrosion even under abnormally severe conditions.

To take advantage of the superiority of D-A "Extra Treated" Diesel Oil, you must *know* how far you may safely lengthen your drain intervals. To do this, D-A's free laboratory analysis is at your service. Ask your local D-A representative for details; he will be glad to show you how you can get the best lubrication for the least cost.



Lubricating heavy-duty equipment across the nation since 1919.

D-A LUBRICANT COMPANY, INC. • INDIANAPOLIS 23, IND.

NEW CAT DW20 SERIES G TRACTORS "FASTER HAULING AND EASIER LOADING"

Bryan Carl, Partner, Dean Word Co., New Braunfels, Texas

That's the substance of the many field reports coming in from contractors everywhere! The new DW20s, matched with new No. 482 Series B Scrapers, are paying off with faster cycles, greater production and more profits!

Here you see one of two new DW20s hauling on a section of Interstate Highway near New Braunfels, Texas. With a D9 pushing, average loading time is 30 seconds. Partner Bryan Carl of Dean Word Co. says: "Our new DW20 Series G Tractors are faster hauling and easier loading. Caterpillar-built equipment has longer life with less down time—it stays on the job better. We get excellent service from our Caterpillar Dealer."

Look at the ratings on the new DW20-No. 482. To handle the increases in horsepower, rimpull and scraper ratings, both tractor and scraper have been improved in design and structure. The tractor, for example, has stronger final drives and improved transmission forks. The scraper has a stronger bowl, push frame, draft frame and apron. Result: better service life, less maintenance and cheaper dirt.

Here's a four-wheel rig that meets your needs for higher, more economical production on today's big jobs. Ask your Caterpillar Dealer for complete facts about it. See for yourself how the new DW20-No. 482 can step up your production!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.



NEW DW20-No. 482 SERIES G SERIES B

NEW HP	—345 (maximum output)—increased 8%
NEW RIMPULL	—39,565 lb. (maximum)—increased 12%
NEW SPEEDS	—increased rimpull provides up to 20% faster travel speeds under similar haul road conditions
NEW CAPACITY	—24 cu. yd. (struck) 34 cu. yd. (heaped)

Corresponding increases have been made in the new two-wheel DW21 Series G Tractor.

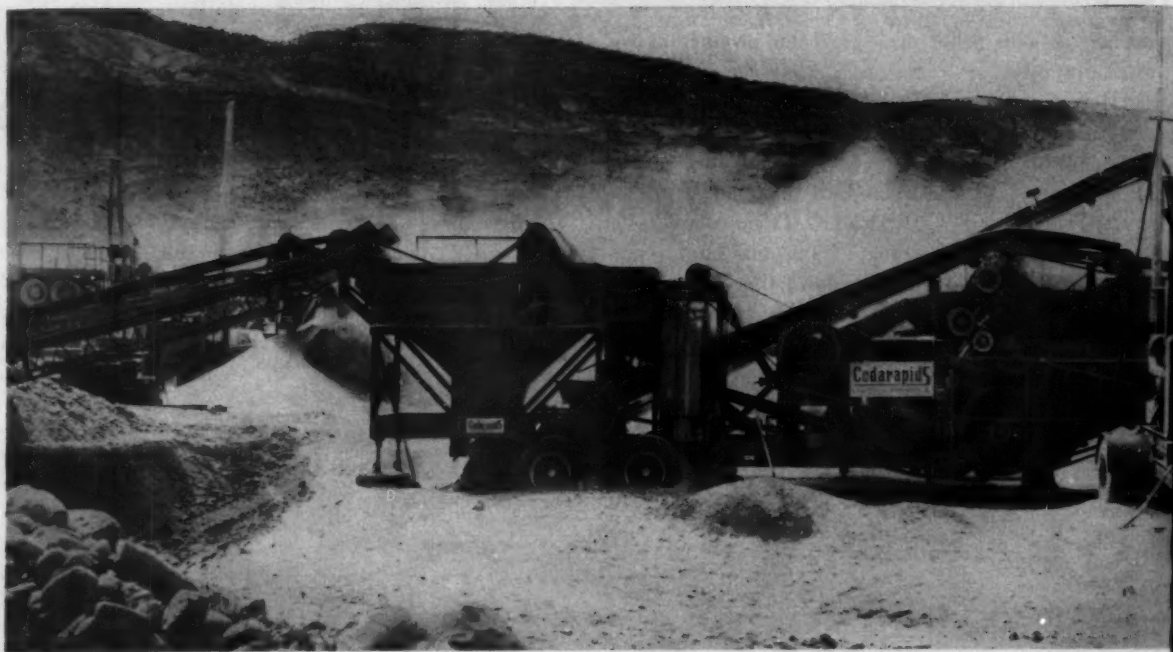
CATERPILLAR

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**HAUL AT LOWEST
COST PER CU. YD.**

*Listen to your equipment;
it will tell you when it needs
attention, this expert says.*

PORTABLE CRUSHING PLANT



BUILT TO TAKE A BEATING—Components of a portable crushing plant—jaw crusher, roll crusher, vibrating screen, conveyors—

are ruggedly built, but they need special attention to stand up to their punishing work day after day without letup in production.

WE'VE ALL HEARD the proud owner of a perfectly functioning automobile remark, "She purrs like a kitten!" Did you ever realize your portable crushing plant is always talking to you? Are you watching and listening?

The "tinkling" or "thumping" sound you hear is the loose bolt asking to be tightened. The pungent odor of burnt rubber tells you V-belts are loose or conveyor belts are misaligned. The squeaky bearing or the hot bearing is asking for lubricant or relief from too much lubricant. The wobbling sheave, flywheel, or sprocket is telling you they should be tightened. The smoking V-belt drive is asking to be tightened. The shower of rocks spilling from conveyor belts, screens, bins, chutes or elevating wheel is constantly reminding you that your attention is required.

Today's high cost of equipment downtime makes it imperative

that we listen to our equipment. It's telling us to setup a practical maintenance program. And most important, it insists we see that the maintenance program is actively and regularly applied.

The equipment manufacturer today, well aware of these facts, has incorporated built-in features to assist the operator in the proper operation and maintenance of portable crushing equipment. Instruction manuals, parts, books, and various types of plates and charts are made available to the operator. Operation and maintenance schools are established to train personnel to keep equipment operating at the lowest possible per ton cost.

The manufacturer makes a final inspection of the equipment before it leaves the factory. However, stresses, strains, and vibrations during shipping can loosen some assemblies. The first few days of operation under load is

the most critical period in the crushing operation from an operational and maintenance standpoint. The factory or distributor's service personnel usually are available to start equipment, but it is the final responsibility of the plant operators to check out the equipment according to the manufacturer's recommendations.

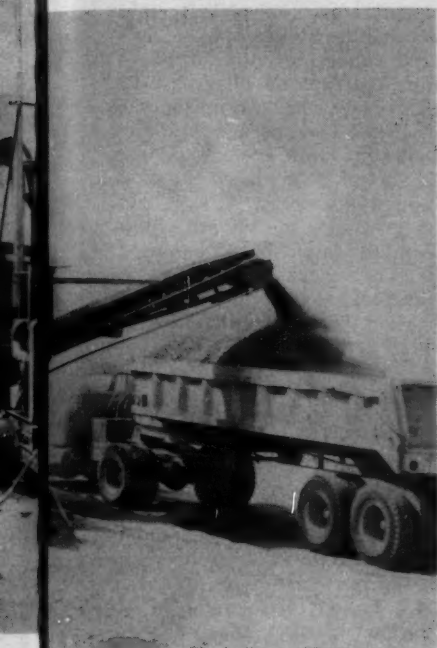
The basic portable crushing plant usually consists of a combination of various types of crushers, vibrating screens, conveyors, V-belts and chain drives, gear boxes, speed reducers, and, of course, a power source (gasoline diesel, or electric). Let's listen to each of these component units individually.

Jaw Crushers

With reasonable care and proper operation, jaw crushers will give good service and maximum tonnage.

1. Loose key plate and pitman

E CRUSHERS



wedge bolts result in excessive jaw wear and loss of tonnage. Remember to keep the crusher jaws tight.

2. A thumping tension rod assembly should tell you excessive recoil action is evident in your crusher and premature wear can result in shaft and bearing assembly, toggle plate, toggle seat, and adjusting mechanism. Keep the tension rod assembly tight.

3. Also, a thumping noise in the adjusting mechanism should warn you to re-adjust this assembly or excessive peening and wear will result. Adjust this mechanism under load each time a new part is assembled in this area.

4. Wobbling flywheels tell you the crusher is "in compaction" (too small discharge opening, improper type of jaws, or the crushing plant is out of balance). Follow the manufacturer's recommendations on minimum jaw settings and type of jaws.

5. Do not use jaws that differ in types of corrugations, thickness, or design without consulting the manufacturer. Such design changes may require design changes in other parts of the crusher.

Remember the use of other than factory-recommended parts can affect the life and efficiency of your crusher and can terminate responsibility on part of the manufacturer. Think, does the party furnishing competitive parts assume any responsibilities if his recommendations damage your equipment?

6. Electric arc welding through bearing assemblies causes premature bearing failure. Always attach ground cables directly to the area being welded.

7. Read the operator's manual.

8. Lubricate properly. To maintain an effective dust and moisture protection, there should be a film of lubricant between the stationary and rotating labyrinth seals. Add small amounts of lubricant at frequent intervals to maintain this seal.

Roll Crushers

To give good service and maximum tonnage, roll crushers need constant attention. Most of the recommendations on the jaw crushers apply to roll crushers.

1. After the roll crusher has operated under load for a few hours, re-tighten the nuts on all tapered shaft assemblies. The flywheel and pinion gear on the countershaft, the finger gears and the spur gear on the roll shafts have all been tightened at the factory, but they always must be "seated-in" under full crushing load. This can be done only at the crushing site. The manufacturer provides removable covers on gear cases, the tools, and instructions, but it is the responsibility of the operator to see that it is done before the shaft fits are damaged beyond repair.

2. A thumping movable bearing housing warns you to tighten the spring adjustment. The slide

About the Author

FRANK J. LOUFEK is Assistant Chief Engineer of the Iowa Manufacturing Co., makers of Cedarapids crushers. A graduate of Iowa State College with a B.S. in Mechanical Engineering, he joined Iowa in 1941.



bars are worn out, the roll shells are excessively worn, or the stage of reduction is too great.

3. Maintain parallel faces between stationary and movable roll shells. Always use equal shims on both sides of crusher in making adjustments.

4. Dished roll shell must be built up with weld to avoid high circulating load in plant. Avoid arc welding through bearings ground directly to roll shell.

5. Excessive roll shell wear results if discharge opening is too small. Watch for bubbling or excessive belching of material in hopper.

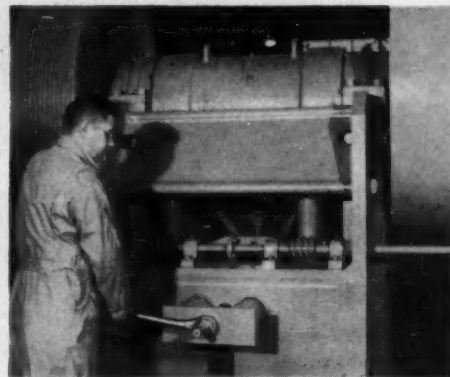
6. Lubricate properly.

Vibrating Screens

To get maximum service, minimum downtime, and greatest efficiency from vibrating screens, give them proper maintenance.

1. Maintain proper tension on V-belt drives. If belts are too tight premature failure will result in the belts themselves, and the shaft and bearing assemblies will be overloaded. V-belts that are too loose will start snaking, turn over, overheat, overstretch, jump off, or break in half.

2. Rattles or thumping noises in the screen box tells you screen clamp bolts should be tightened



JAW CRUSHER—Workman tightens tension rod assembly loosened by recoil action of crusher. Adjust this mechanism to prevent wear of shaft and bearings.

or broken bolts replaced. If they are not tight, the result is excessive wear of screen wire and screen frames and loss of production.

3. Keep all pulleys tight on shafts, especially at initial operation after screen has operated under load.

4. Keep coil and support springs in proper adjustment. Check the operator's manual for detailed instructions.

5. Keep all bolts and nuts tight. Remember this is a vibrating screen. Vibrations tend to loosen all bolted assemblies.

6. Always use screen wire as small in diameter as possible to get more openings per sq. ft. More openings in each square foot of screen area means more tonnage.

7. Operate at manufacturer's recommended rpm.

Conveyors

1. Keep conveyor belts properly aligned. This is especially important at the initial operation under load. Misalignment not only causes excessive wear at the edges of the belt, but in many cases the belt rips lengthwise when it is forced against support assemblies.

2. Keep conveyor belt lacings intact. Listen for flopping sounds when ripped belts or worn out lacing strikes rock deflectors or belt wipers.

3. Adjust skirtboard flashing. Spillage of material should be sufficient evidence that flashing is not properly adjusted. Flying rocks can easily fall between V-belts and pulleys and either throw them off or cut them.

4. Compensate for ambient-temperature changes by properly tensioning belts. Too much looseness causes slippage and eventually reduces life of conveyor belts. Over tensioned belts cause premature failure of head and tail shaft assemblies.

5. Can you smell rubber burning? Is the conveyor belt riding against metal? Belt life can be greatly increased if special attention is given during the initial operation of unit. Once a conveyor belt is over-stretched on one side it is extremely difficult to keep it in alignment. Early attention pays big dividends in the long pull. Keep belts running true.

6. Adjust belt wipers to keep rocks away from pulleys. Don't



VIBRATING SCREEN—Aligning and adjusting tension of drive pulleys cuts belt wear, prevents overloading of bearings.

punch holes in expensive conveyor belts.

7. Keep return rolls clean. Built-up return rolls make conveyor belts drift.

8. Squeaking troughing rolls warn that rocks may be lodged between rollers, bearings may need replacing, or bolts may need tightening or replacing.

Lubrication

The manufacturer and equipment user realize the importance of lubrication in cutting down expensive downtime. Lubricant suppliers offer many services. They supply modern, portable power equipment, multipurpose and specialized lubricants, and lube charts. They work hand in hand with equipment manufacturer and user.

However, no maintenance or lubrication program will be worth much unless the grease man makes the final application correctly. Wipe off grease fittings before applying the grease gun. The fine, abrasive material always present around a crushing plant must be kept out of bearing assemblies. Contaminated lubricant must be wiped off each grease fitting before applying clean grease gun or the bearings will fail prematurely.

Close bearing tolerances are required to maintain high speed operation in portable crushing plants. Remember, although they are big and ruggedly built, the bearing operating clearances and housing fits often are tighter in tolerance in crushers, screens, and component units than in other construction equipment.

In the best spring loaded, top

ball closure type of grease fitting the grease opening can be as large as 3/32 in. diameter. If the grease man doesn't wipe off contaminated lubricant, he will inject abrasive cutting agents directly into bearings. Premature failure will result.

Before a crushing plant is shipped from the factory, most manufacturers install plastic, neoprene rubber, or other types of protective caps on all grease fittings. They can be a nuisance to the grease man because they are small, but they are inexpensive and should be replaced if lost or dropped in the dust.

A good attitude toward equipment lubrication is contagious. If the owner checks his plant closely and insists on proper lube application, his men will follow his lead.

Getting Top Production

Balancing the components of a portable crusher-plant to obtain the greatest efficiency is very important.

1. The jaw crusher, roll crusher, and screen must each do its share of the work. The two crusher stage of reduction must be used in the proper proportions.

2. The correct openings of screen wire should be selected to direct material in proper proportions to the crusher and to maintain continuity throughout the plant.

3. Watch for too great a re-circulating load. Make necessary adjustments in crushers or screens to maintain a uniform load in the screen box. Re-circulating means loss of production.

4. Maintain a uniform feed to crushing plant. Spasmodic feeding throws the plant out of balance.

5. Establish good truck circulation to move material steadily away from plant. Use portable truck loading bin units to keep plant running.

Minutes count up. For example, if your production is 120 yd per hr and you lose 6 min per hour, in a 10-hour day you have lost one hour, or 120 yd. In one six day week you lose 720 yd, in one month the loss totals over 3,000 yd., in one year it could amount to over 30,000 yd. Minutes lost because of intermittent crushing can mean the difference between profit and loss.

...and now another
GREAT TRACTOR SHOVEL



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COMPLETELY NEW W-10 TERRALOAD'R

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NEW 6,500-lb. capacity CASE W-10 TERRALOAD

- 4-wheel drive
- Rear-wheel full-power-steer



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The W-10 was engineered to take full advantage of the tremendous power developed by the famous Case 401-cu. in. diesel engine... field-proven by over 12,000,000 hours of operation on jobs the world-over.

★ **POWRCEL combustion**—gives greater fuel economy, cleaner burning, smoother running... plus direct 24-volt electric starting.

★ **Six-point fuel filtration**—plus dry-type air filter which reduces dirt intake more than 90% over oil-bath cleaners.

★ **Extra-heavy, ribbed engine block**—gives more rigid engine, reduces flexing and results in less internal wear... increases usable HP and lengthens engine life.

★ **Heavy-duty 7 bearing crankshaft**—with 116 sq. in. of bearing surface... more than any other engine in its HP class.

★ **Pressurized cooling**—for uniform temperature. Controlled circulation lengthens valve life.

★ **Multiple cylinder heads**—prevent warping, make servicing easy.

★ **Diesel economy**—operates for pennies an hour, on a minimum of low-cost diesel fuel.

BRIEF SPECIFICATIONS

Carry capacity (4 MPH).....	6,500 lbs.
Lift capacity (0 MPH).....	13,000 lbs.
Max. HP	100
Forward speeds (3).....	0 to 23 MPH
Reverse speeds (3).....	0 to 23 MPH
Tires (std.).....	16.00 x 24 — 12 ply
Overall height	7'3"
Width over hubs.....	94½"
Turning radius	20'
Weight (without tire fill).....	11,120 lbs.

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Pallet f
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Totally balanced for:

X GREATER WORK OUTPUT

Balanced power-to-weight ratio... exactly the right combination of engine power, traction and machine weight... insures top all-around efficiency... with minimum wheel slippage, maximum fuel economy.

X FASTER, SMOOTHER OPERATION

Balanced weight distribution, with 60% of empty weight on rear wheels, provides greater ground-gripping traction. No bucking or raising rear wheels off ground. This, combined with torque-converter drive and powerful breakout, gets heaping loads fast. New power-shift linkage gives more efficient control of operating speeds.

X LONGER LIFE

Case balanced construction results in less strain on engine and transmission, less wear on tires. All-welded channel subframe, heavy steel axles and cross-braced loader assembly provide maximum strength and rigidity.

X EASIER SERVICING

Brake, electrical and steering systems are all easily accessible by merely removing front cover plate. Multiple engine cylinder heads and removable wet-type sleeves permit servicing without pulling engine.

X SAFER HANDLING

Note that the W-10 loader arms are pivoted *ahead* of operator. This exclusive feature gives unequalled visibility, plus maximum operator safety. Better weight distribution, low center of gravity and wide-tread stability mean greater safety and permit moving bigger loads at higher speeds... less bouncing.

X LOWER COST

With all its advanced features, the W-10 is priced *lower* than its nearest competitor. That's because Case builds the entire machine. Unit construction also means one warranty, one service source... no split responsibility.

INTERCHANGEABLE ATTACHMENTS FOR EXTRA YEAR 'ROUND PROFIT

Buckets to fit the job, from 1¼-cu. yd. heavy duty up to 3½-cu. yd. light material. 2-cu. yd. SAE rated standard.

Pallet fork and concrete block fork. Lifts 5,000 lbs. to 10 ft.

Brush rake. Clears, carries and stacks trees, brush.

Snow plows. Angling and V-types.

Dazer blade. For backfilling, leveling and grading work.

All-weather cab. Glass enclosed. Heater also available.

See how the W-10 can cut your costs
on jobs like these...

ASK FOR A FREE DEMONSTRATION



EXCAVATING AND LOADING



GRADING AND BACKFILLING



HEAVY LIFTING AND TRANSPORTING



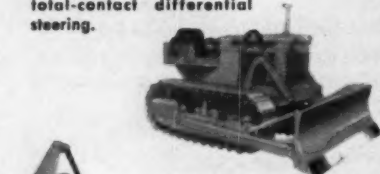
HANDLING BULK MATERIALS

W-9 Terraload'r. 6000-lb. capacity, 4-wheel-drive, rear-wheel power-steer. 1½, 1¾ or 2¾-cu. yd. bucket. Gas or diesel engine. Torque converter. Power-shift transmission.



M-38 3500-lb. capacity fork lift. 9', 14'3" or 21'4" mast. 50 hp* gas engine. Torque converter. 3-speed gear transmission. Improved total-contact differential steering.

420 42 hp* gas engine. Ferrometallic clutch. 3-speed gear transmission. Improved total-contact differential steering.



600 62 hp* diesel or gas, with torque converter, 4-speed hydraulic power-shift transmission and power-steering.



800 80 hp* diesel engine. Case Terramatic® Drive. Torsion-bar track suspension.



W-5 Terraload'r. 3000-lb. capacity, front-wheel-drive, rear-wheel power-steer. 1 or 1½-cu. yd. bucket. Torque-converter drive. Power-shift.

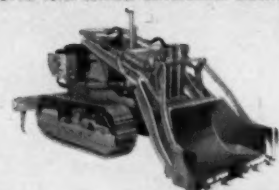


M-420 4000-lb. capacity fork lift. 9½', 14'3" or 21'6" mast. 47 hp* gas engine. Torque converter. 8-speed shuttle transmission. Power-steer.

420 47 hp* gas engine. Torque converter. 8-speed shuttle transmission. Power-steering.



520 50 hp* gas or 45 hp* diesel engine. Torque converter. 3-speed gear transmission. Improved total-contact differential steering.



1000 100 hp* diesel engine. Case Terramatic Drive. Torsion-bar suspension.



*Gross engine flywheel HP. Sea level (calculated) max. HP (based on 500 F and 29.92" Hg.). Mfr's. rating. Nebraska test not yet available.

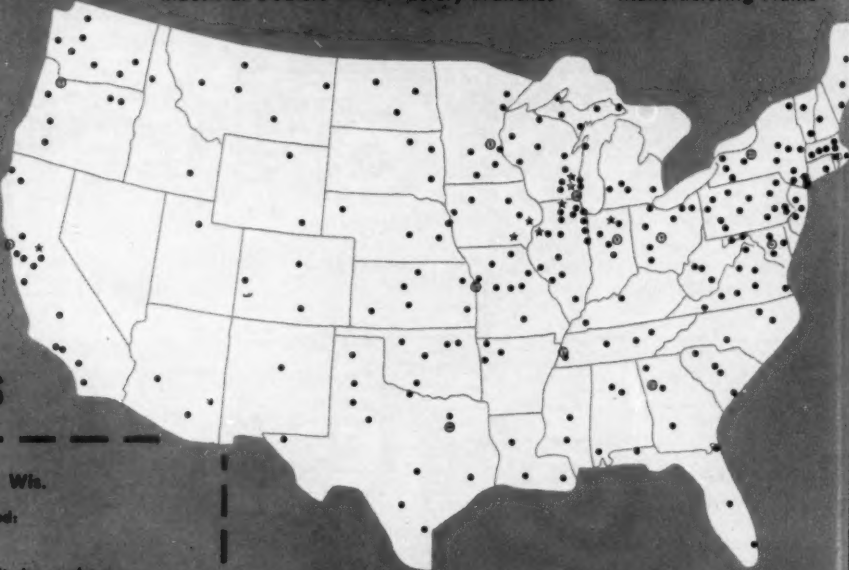
The new CASE W-10

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☐ New W-10 Terraload'r.

☐ _____ Case unit shown above.

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Your local Case Industrial Dealer has factory-approved equipment and factory-trained mechanics to service the machines he sells. In addition, the nationwide network of 8 Case factories, and 12 strategically-located branches assures you of prompt, efficient repair parts service whenever and wherever needed.

The top CF&W take Wic M but in pe Wic of q stan are " qual CF& wire oper exact cedur

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YOU CAN'T
BARGAIN
WITH SAFETY



Wire Ropes may look alike... but it's performance that counts

The Image of CF&I stands for the top performance records of all CF&I steel products. For instance, take one of these products—CF&I-Wickwire Rope.

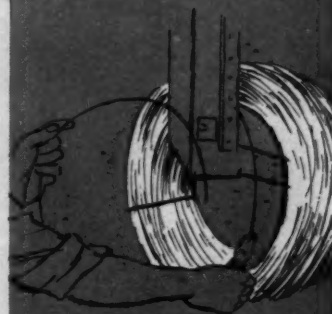
Many brands of rope *look* alike but the rope you buy must pay off in *performance*, not *appearance*. With Wickwire Rope you get a number of quality factors that lead to outstanding performance. These factors are "built-in" the rope through many quality controls and tests. Since CF&I performs all steel producing, wire making and rope fabricating operations within its own plants, exacting control and testing procedures can be carried out and

supervised at every step. Here is just one of these procedures:

Both-Ends Physical Tests

Samples are cut from both ends of every coil of wire and given complete physical tests—for tensile strength, roundness, torsion and uniformity of diameter. Coils that fail any test are rejected for such critical applications as wire rope.

We have recently printed several folders that discuss many more Wickwire control and testing procedures, plus wire rope recommendations for specific equipment. To get a copy, contact the nearest CF&I sales office—but please *state your industry or type of equipment*.



Both-ends testing of wire ensures safety and top performance in CF&I-Wickwire Rope.

WICKWIRE ROPE

THE COLORADO FUEL AND IRON CORPORATION

In the West THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Farmington (N. M.) • Fort Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Odessa (Tex.) • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Tulsa • Wichita
In the East WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • New Orleans • New York • Philadelphia



Here's why it's important that plugs be correctly matched to

Champion engineers show the importance of correct spark plug design—by demonstrating what can happen when spark plugs do not meet an engine's requirements—

If you have any of these problems, often caused by mismatched spark plugs or unusual operating conditions, ask a Champion representative to call. He'll help you select the Champion spark plug types that are *correctly matched* to the requirements of every engine



2. The electrodes in these spark plugs got too hot and burned after only 1200 miles in use! Why? Because the plugs were not the correct type for the engine in which they were installed. "Mismatched" spark plugs often burn electrodes quickly, cause loss of power, hard starting, and require too-frequent replacement.



3. Excessive fouling or short electrode-life can also be caused by prolonged low- or high-speed driving. Champion solves these problems by designing *several* plug types with different heat ranges for every engine. If you have a problem, ask a Champion representative to help you select the Champion plugs best suited to *your* engines.

CHAMPION SPARK PLUG COMPANY

your spark your engines

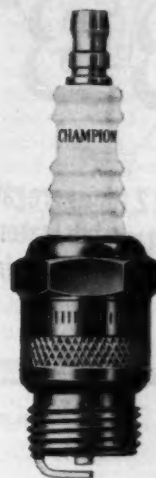
in your fleet. (Champion designs spark plug types for *every* make of truck and car!) Use this free Champion service to improve your fleet's ignition performance. Call your Champion representative or supplier, or write Champion at Toledo 1, Ohio.



1. Excessive fouling occurs when spark plug tips do not get hot enough to burn away carbon and oil deposits. "Mismatched" spark plugs that fire all right at average engine speeds, often become fouled when combustion chamber temperatures drop during prolonged low speed or idle operation. Fouled plugs misfire, waste gas and power, and require frequent servicing.



4. There's a Champion spark plug type correctly matched to the specific requirements of every engine. That's why you can tune your engines to deliver peak performance with Champion spark plugs. Get full power, top gas economy and longer spark plug life—install Champion spark plugs in *every* engine in your fleet.



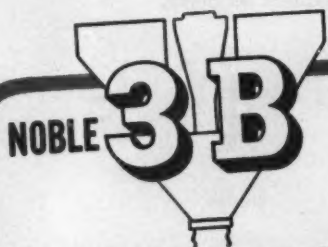
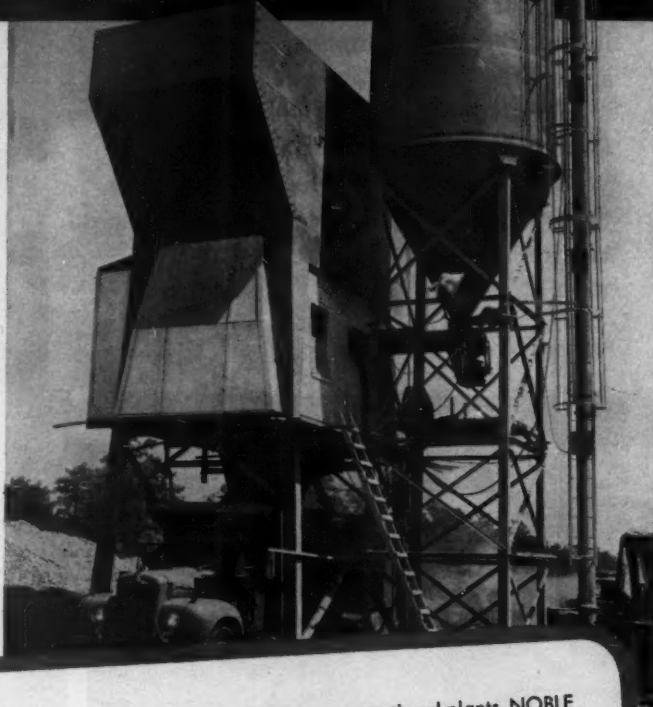
CHAMPION

SPARK PLUGS

TOLEDO 1, OHIO

Mile-a-day highway paving record set with NOBLE 3B concrete batching plant

5,394 feet of highway paving setting a new 1-day record was supplied entirely by NOBLE 3B concrete batching plant. Two dual drum pavers pouring concrete every 30 seconds on relocation of Rhode Island Routes 2 and 3 depended on an uninterrupted flow of aggregates and cement. The 1150 batches required were batched and discharged by NOBLE 3B on schedule without a hitch! With overhead aggregate storage of 150 tons and separate overhead cement storage of 500 barrels, NOBLE 3B high speed output kept 8 dry batch trucks hauling materials in a steady stream to the paving site 7 miles away. Of all batching plants familiar to the contractor, **Campanella & Cardl**, in its ready-mix concrete division, NOBLE 3B was selected for highest productivity, consistent quality and reliable, economical operation.



3 batchers (2 for aggregates, 1 for cement) weigh materials simultaneously for a single batch.

Batching quality concrete over twice as fast as conventional plants, NOBLE 3B keeps pace with fast-moving paving jobs. Sub-assembled at factory, it is transported rapidly to job site and quickly erected with no outside purchase of essential components or extensive field assembly and wiring. A pair of 3B plants set up as a dual twin-driveway single-stop plant for air-field construction when highest output is required can later be split into 2 complete plants for separate highway paving jobs in 1-stop or 2-stop set-ups controlled by a single operator.

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*Good operation,
frequent inspection,
regular lubrication,
and prompt repair—
that's what this expert calls
the fundamentals
of maintenance.*

SHOVELS and CRANES

About the Author

D. W. PARST became service manager of the Bucyrus-Erie Company in 1957. Before that he spent a great many years supervising B-E's field erection of cranes and shovels.



MAINTENANCE of power shovels, draglines, and cranes should be thought of and dealt with in terms of its four component parts—good operation, frequent inspection and adjustment, regular lubrication, and prompt repair when necessary.

Good Operation

Maintenance must start with good operating techniques. There's a best way to accomplish each job—come as close to it as you can for the sake of your production equipment.

With shovels, make short moves often to maintain most efficient digging angle. Keep machines working on solid footing the full length of both crawlers. Where humps occur, dig them out or move around them. Work shovels with drive chains away from digging and work draglines and hoes with drive chains toward digging. This is handier for moving and provides more efficient braking. It also leaves a tight

crawler belt on the ground and the slack on top where it belongs while digging and moving.

Never exceed the recommended capacity of any machine. Overloading always results in extra maintenance and delay.

On cranes, never exceed the stability ratings shown in the manufacturer's table of maximum allowable lifting loads. Do not work with boom angle greater than 78 deg. from the horizontal. Be sure to use the proper length of rope for each job. Excessive overwinding simply results in greatly increased wear. Watch the lines carefully. Inspect all ropes, including boom suspension daily—and replace promptly those that show any considerable number of broken wires.

Don't travel with cranes while carrying close to maximum loads. To move large loads beyond machine radius: pick up, swing the load ahead, set it down, move around and pick it up again, repeating as necessary.



LUBRICATE REGULARLY—Correct, regular lubrication is the best guarantee of long life and trouble-free work from the machine.

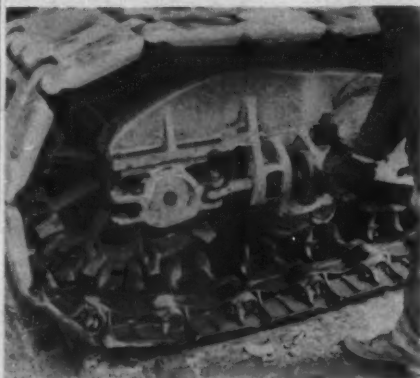
Inspection and Adjustment

Even the best machine will handle poorly if it isn't adjusted properly. Keep adjustments right—and keep after them. Machines should be inspected thoroughly at least once a week. Clutches should be adjusted at normal operating temperatures. Bands, if reversible, should be reversed when the dead end has worn off about one-third. Do not use compounds on bands, and always keep them and their housings clean. Clutch bands require adjustment more frequently when new than after they are worn in.

Keep the boom hoist in constant adjustment. Check it occasionally when it is not being used.

On dipper trips, use the shortest latch adjustment that will catch and hold securely. On draglines, the drag hitch should be adjusted for best penetration.

Crawler belts should be as loose as possible without losing proper tracking of the driving tumblers. Firm footing permits use of a tighter belt than is advisable in mud or loose earth. When traveling on pavement or other hard surfaces, tighten belts if they tend to slap. The drive chain also will slap when too



CONSIDER THE TRACKS—It doesn't take long to adjust track tension on your crawler rig. But the effort pays off in longer track wear and maneuverability.

loose and may cause destructive jerks when load is applied or released.

On the other hand, if the drive chain is too tight, excessive wear results. Keep it just right by checking and adjusting it regularly.

Control linkage and the operating levers should be checked regularly and adjusted to eliminate lost motion—be sure to leave a safe release margin.

Lubrication

Correct, regular lubrication cannot be stressed enough. Correct lubrication is your best contribution toward long life of machinery and trouble-free operation. Lubricating in itself isn't enough—the right lubricant in the correct amount must be used for maximum effectiveness. A poor job may do more harm than good.

Do not use graphite greases in ball or roller bearings. When forcing lubricant through a plain bearing, it's a good idea to force the old lubricant out the other side and wipe it off. This cleans out the dirt.

Whenever possible, turn parts to change load distribution after greasing, then re-grease to insure distribution of lubricant to all points of bearing.

Oil should be used on roller chains, and it should be worked in around the pins by moving the chain back and forth and re-lubricating. Lubrication should be handled at the beginning of each shift except for any engine

crankcase or gear case oil changes that are best handled at noon when the oil is at maximum temperature. Use water resistant greases where parts are exposed to ground water and weather. And grease often in wet weather.

Field tests show that, contrary to former practices, tread pins last longer when they are kept oiled. Used drained crankcase oil and watch the results.

Ropes, except drag ropes on draglines, should be painted with thin, penetrating rope lubricant regularly. Heating the lubricant will increase penetration, but cold steel will nullify this effect. Consequently, do the job at noon of the warmest day possible.

Lubricate suspension ropes even when the boom hoist is not being used. Damage from vibration and rust is often more serious when the lubricant is not occasionally redistributed by flexing over sheaves. The swing racks, especially the internal racks, are often neglected. Remember this: only a quarter to a half of the giant gear gets the majority of the wear so lubricate the entire unit regularly and inspect and touch the shiny wear spots once a shift.

Apply "tacky" type open gear compound with high surface tension, resistant to dust. When it becomes gritty and caked, scrape or clean it off with a kerosene-soaked rag and replace it with clean lubricant. On center pintle

type machines particularly, watch the rollers (the rear ones) to be sure the old grease doesn't cake preventing them from turning.

Prompt Repair

Clean machinery makes locating needed repairs easy. Catching troubles when they are small saves time, work, and money. On each structural repair, try to add strength to the original unit.

Whenever cracks start on castings or structural members, V out and weld promptly before the part breaks through. Apply patches with slanting or fishtail ends to distribute stresses rather than with square ends that concentrate loads and invite breakage.

When parts must be replaced, use those made by the manufacturer of the machines. Each factory-made part is sized accurately and made of correctly treated materials. A "field-made" or "will-fit" part may be destroying other, more expensive parts operating in the same assembly. Hidden destruction can occur even while the replacement part is giving satisfactory service in its own particular function.

However careful you are in the upkeep of the various parts of your machine, you can't operate it without a smooth-running engine.

If you don't have complete up-to-date care and maintenance instructions on the engine, obtain them from the manufacturer.



CARE FOR BUCKET TEETH—Dipper teeth need dental maintenance as well as human ones. When a dipper tooth is worn, repair it promptly or, if necessary, replace it.

New!

BOSTON CONCORD IMPERIAL STEAM HOSE with exclusive PATREX TUBE AND COVER plus STAINLESS STEEL BRAID



Two more major product advances by BOSTON establish new standards of performance . . . to meet your most exacting requirements. Here's why they give new Boston Concord Imperial Steam Hose unmatched strength, durability and economy.

PATREX—is the totally new compound from BOSTON research that gives tube and cover extreme heat resistance, amazing flexibility and increased abrasion resistance. Even at 450° F. Boston Concord Imperial shrugs off hardening and cracking that kills ordinary hose!

STAINLESS STEEL INNER BRAID—can't rust in the bore . . . absolutely protects against tube swelling! Two other steel braid barriers embedded in hose wall reinforce Patrex tube for maximum protection against burst. Completely controls pulsating saturated steam pressures up to 250 PSI!

If you want the best, ask your BOSTON distributor about new BOSTON CONCORD IMPERIAL STEAM HOSE. The new golden cover tells you, "It's the most durable steam hose you can buy!"

BOSTON

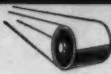
BOSTON WOVEN HOSE & RUBBER COMPANY

DIV. OF AMERICAN SILTRITE RUBBER CO., INC.

BOSTON 3, MASS.



INDUSTRIAL HOSE



BELTING



V-BELTS



PACKING



MATTING



TAPE



COLORADO

In 30 seconds, Model 480's 600 hp regularly heaps 32-yd scraper to spill point. Machine owner: C. L. Huebner, Denver.

MICHIGAN DOZERS...4 sizes*

*MODEL 180—165 hp | *MODEL 280—262 hp | *MODEL 380—375 hp | *MODEL 480—600 hp



CALIFORNIA

Sand fill at Oakland Airport has no effect on Model 380's tires yet it wore out crawler tracks in 6 weeks. Owner: Utah Construction Co, San Francisco.



FLORIDA

Maintenance costs dropped substantially when this Model 280 took place of crawler push-loading sand. Owner: Cone Bros, Tampa.

GEORGIA

Replacing crawler tandems with 600 hp Model 480 resulted in 14 more scraper loads per hour, 3.8 more yds per load, \$123 per hour additional profit. Owner: Hugh Steele Inc, College Park.





MINNESOTA

Fast 262 hp Model 280 handles *both* rock fill—360 loads, 5,000 yds per day—and shovel cleanup 3 miles away. Owner: Alley Construction Co, Faribault.



KANSAS

Wet, sticky hauler-dumped fill proves no problem for high-traction 375 hp Model 380 on Superhighway assignment. Owner: Bennett Construction Co, Bethel.

...*Job-proved* coast to coast



OHIO

Tires replaced by steel wheels, this Model 180 dozes and compacts clay fill. Owner: V. N. Holderman & Sons, Columbus.



PENNSYLVANIA

Half-minute push of 375 hp Michigan Model 380 loads 25-yd pans in rocky soil. Owner: Latrobe Construction Co, Latrobe.

MICHIGAN

High-speed Model 280 spreads more sand fill than big crawler it replaced, reduces maintenance, alone attains required compaction. Owner: Smith Bros, Cassopolis.



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Construction Machinery Division
2403 Pipestone Road, Benton Harbor 21, Michigan
In Canada: Canadian Clark Ltd., St. Thomas, Ontario

From coast to coast, owners report



COLORADO

C. S. Jones, landscaping the new 17,800 acre Air Force Academy, reports his two Model 110 Michigan Scrapers have upped output 20% over other self-propelled pans in same price class. Main reasons: Michigan's greater capacity (10½ vs 9 to 9½ yds), easier loading (9 pay yds in 20 to 45 seconds).



CALIFORNIA

U. S. Borax & Chemical Corp, digging out largest known deposit of sodium borate in world, gets BIG production from team of 29 yd Model 310 Michigan Scrapper and 600 hp Model 480 Michigan Dozer. Payloads weigh out at 26 yds—3 yds more than biggest track-type pushers could load previously.



WASHINGTON

Henry M. Johnson Excavating Co, Lewiston, Idaho, leveling for Washington State College's new science building, chose Michigan for "dependability." Scrapper has all-Clark matched, designed and built power train . . . the same power train design used and proved in 10,000 Michigan Tractor Shovels.



TEXAS

T. R. Vardeman & Son Construction Co, digging lake for City of San Augustine, posts good production average with their Model 210 Michigan Scrapper. On 2,400 ft cycles, 19-yd rig moves 15 loads per hour.



INDIANA

Leon Meshberger, working small scattered jobs throughout the Indianapolis-Columbus area, roads his Model 210 Michigan Scrapper everywhere. Self-powered moves save loading, unloading delays and costs. Machine's top speed is over 30 mph.

"more work done" with Michigan Scrapers



KENTUCKY

Holloway & Sons Construction Co, building quarry-to-river dock access road, loads Model 110 Michigan Scrapers with small (85 hp) pusher, yet gets 8¾ pay yds, scale-weighed, per trip. For added versatility, the 10½ yd pans interchange with 13 ton Rear Dumps. Scraper is also available in 4-wheel towed model.



FLORIDA

S. M. Wall Co, building a 10 mile, 120,000 yd cutoff around city of Archer, teamed two Model 210 Michigan Scrapers with a Model 280 Michigan Dozer: got 14 pay yd, 40 sec loading. Scrapers and pusher provided the efficiencies of *identical power trains*: matched speeds, easier maintenance, lower parts stocks.



NEW JERSEY

Sallcon Inc, forced by high labor costs to lay off men after each small job, then rehire for new contracts, solved critical training problem with Michigan Scrapers. Power-steered, power-shifted, torque converter Model 110's are "so easy to run," says owner, "new men become proficient after only a few cycles."



CONNECTICUT

Brancifort Bros, grading new shopping plaza, moved 1,400 yds per 9 hour day with their two Model 110 Michigan Scrapers. Note high apron lift; and good view operator has of well-controlled positive-ejection spread. Like all Michigans, unit is fully hydraulic; only cable is short length, yoke to apron.



ONTARIO

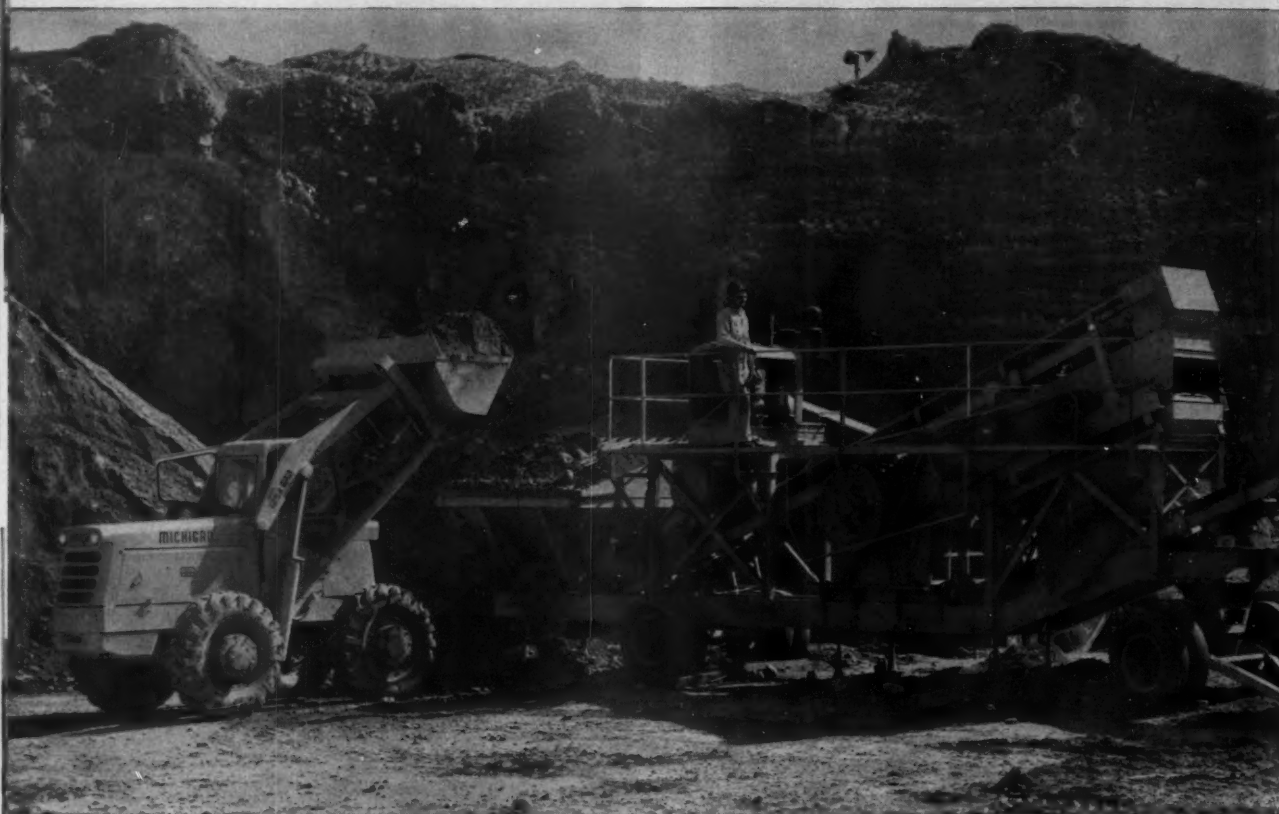
George Schultz Construction Ltd, spreading base course, replaced a 10 yd and six 6-yd dump trucks with two 19-yd Michigans. Main advantage of the Scrapers: they hauled 18-yd payloads, unaided, through mud which continually stopped trucks. Also, they spread so accurately, contractor eliminated grader.



Michigan is the registered trademark of
CLARK EQUIPMENT COMPANY
Construction Machinery Division
2403 Pipestone Road, Benton Harbor 17, Michigan
In Canada: Canadian Clark, Ltd., St. Thomas, Ontario

SOME UNUSUAL WAYS

Michigan Tractor Shovels are saving time and money for road builders around the country



Feeds portable crusher—Making good use of its high lift, Michigan Model 125A digs and dumps raw bank gravel into hopper of 100-ton-per-hour base material plant. Photo comes from Southern Hills Inc. pit near Dayton, Ohio, where the 2 yd Michigan did the work of a more expensive, less versatile, far less mobile excavator-crane.

Grades shoulders—Special side bucket attached to Michigan 175A grades 3 ft shoulder next to newly-poured slab. Unique rig does jobs not possible with grader drop-blade . . . including filling holes, distributing gravel, removing spoil. Attachment, designed by Villa Contracting Co, helped widen 27 mi of N.J. Garden State Parkway.



Pours concrete—Hauling concrete in Michigan Tractor Shovel bucket, Slattery Rock Corp. solves problem of laying 6 lanes of New York's Deegan Expressway under low viaduct. Two of these maneuverable "buggies" needed only 4 hours, 200 to 250 trips to pour 800 ft of each 12 ft lane.





Carries pipe—One of Peter Kiewit's 39 Michigans serves as all-around handyman on a company superhighway job in Indiana. This 122 hp model lifts up to 13,000 lbs, carries, 10,000 lbs at 4 mph. Note excellent all-around visibility given operator.



Breaks, loads asphalt—Before resurfacing street in Worcester, Mass., Contractor Charles Chaffee uses 1¼ yd Michigan to strip old asphalt. No "ramming" is required—powerful breakout quickly shatters paving.



Cleans pavement—Highway must stay open said Nashville officials, so Wright & Lopez do cleanup with small, agile 16 cu ft Michigan. Only 4'2" wide, 10'2" long, unit works rapidly, doesn't block traffic, doesn't damage newly-set pavement.

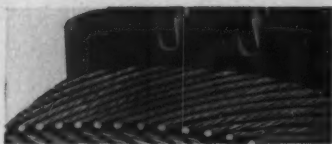


Removes sewer cover—When other big loaders failed, Kirby-Erwood's 133 hp Michigan succeeded in prying off this 2-ton concrete cover. Assignment was part of cleanup before widening Los Angeles freeway.

Digs shot rock—Time studies proved to Cummings-Roberts, Darby, Montana, that this 2¾ yard Michigan would outproduce crawler-loaders in both pit-run and shot-rock, despite narrow benches, 7000' altitude.



Breaks, loads concrete—On New York City street repaving job, Triboro Asphalt Co. breaks and loads 4 to 6-inch concrete slab with this 133 hp Michigan Model 175A.



(STEEL CABLE)



(DOUBLE-STRENGTH NYLON)

NOW! DOUBLE-ARMORED PROTECTION ENDS COSTLY TIRE REPAIRS!



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U.S. ROYAL TRUCK TIRES



United States Rubber



About the Author . . .

ROBERT J. LENZ, who has spent 22 years in various service capacities with the Euclid Division of General Motors Corp., now is Euclid's manager of service.

Best maintenance program is a complete one, says this expert.

OFF-HIGHWAY TRUCKS

WHEN SIR ISAAC NEWTON was awakened by an apple falling on his head, he investigated the forces of nature that made the apple fall down instead of up and published his famous "Law of Gravity."

Operators of off-the-road hauling units don't have to be hit on the head, however, to learn the laws that control the motion (or lack of motion) of their equipment. They soon discover that the only sure way to keep their machines moving and producing regularly is adequate preventive maintenance.

Any mechanism with moving parts needs a certain amount of attention sooner or later, depending upon the job it has to do, to keep it operating efficiently. A timepiece, for example, must be cleaned and oiled every year or so if it is to continue to keep accurate time.

An off-highway truck normally works under very rugged operating conditions and needs a great deal more attention to keep it on the job in top operating condition. Because of these adverse operating conditions, the best way to keep off-highway vehicles working efficiently is an adequate maintenance program.

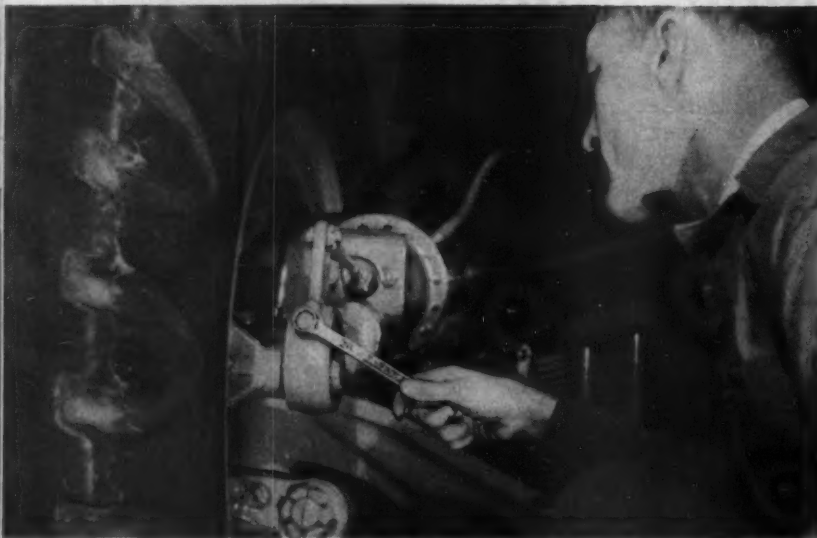
The most important thing about a preventive maintenance program of off-highway hauling units is that it be complete. Proper functioning of every component is essential so each one must be checked regularly. Here are some good periodic check lists.

100-Hour Check

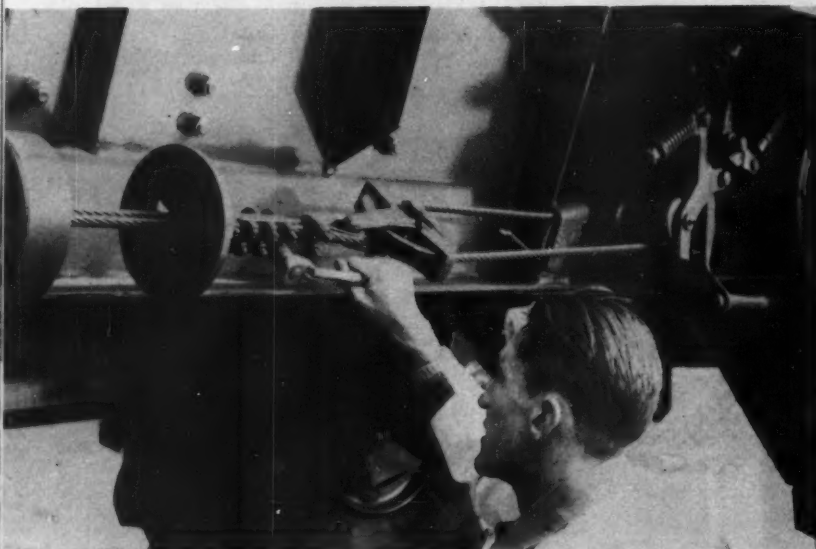
- Tighten engine mounting bolts.
- Tighten crankshaft nut.
- Check all engine lube oil system lines, fittings, and filters for oil leaks.
- Clean crankcase breather.
- Check all fuel system lines, fittings, and pumps for leaks.
- Check all drive belts for proper tension and possible wear.
- Check hoses and components in cooling system for leaks.
- Check anti-freeze.
- Check linkage in clutch for tightness and check clutch adjustment.
- Tighten transmission mounting bolts, shift tower bolts, and power take-off bolts.
- Check all lines and seals in



COOLING SYSTEM—Check the antifreeze every 100 hours along with all hoses and components in the machine's cooling system—then lose no time making needed adjustments.



AXLES—Check and adjust king pins, bushings and toe-ins along with spindle to axle clearance every 100 hours; and don't neglect to tighten all the connections in the system.



CABLES—Examine all cables, sheaves, and door stops every 500 hours and replace when necessary. On scraper units also examine cutting edges and ejector return springs.

Torqmatic converter and transmission for leaks.

- Tighten converter and transmission mounting bolts and shift linkage.

- Check engine synchronization and stall speed.

- Check universal in drive line for looseness, and tighten flange and universal bearing bolts.

- Tighten lug and wheel nuts.

- Check tire condition and inflation.

- Check springs and spring

pads, hold down bolt tightness, and torque rods for possible bending.

- Adjust brakes.

- Check all lines for leaks, and test adjustment of components in air system.

- Check emergency brake adjustment and operation.

- Check brake air assist.

- Check steering adjustment and operation.

- Inspect booster, booster pump, and lines for leaks.

- Test operation of all lights.

- Check specific gravity of each battery cell.

- Check battery cable connections.

- Check operation of all gages and indication lights on instrument panel.

- Check operation of hydraulic system.

- Inspect all hydraulic lines and components for leaks.

- Check wheel wind adjustment on trailer units.

- Examine cables, sheaves, and door stops.

- Examine cables and sheaves, cutting edges, and ejector return spring on scraper units.

- Check operation of all accessories.

- Perform lubrication and servicing in accordance with manufacturer's instructions.

500-Hour Check

Make these checks in addition to all items listed in the 100-hour check.

- Adjust engine valves and time injectors; check engine's governor gap; position injector control rack; tighten cylinder head nuts and clean air box drains.

- Clean fuel pump screen; check and tighten cylinder head and manifold bolts; check blow-by; inspect supercharger for leaks; tighten drive axle and differential companion flange nut, carrier nuts, and axle mounting bolts.

- Check front axle king pins, bushings, and toe-in.

- Check spindle to axle clearance.

- Tighten steering gear mounting bolts.

- Check ball joints and stops.

- Check condition of wiring in the electrical system.

- On rear dump bodies, inspect for holes, cracks, or broken welds, and check cab guard for tightness.

- On trailer units, check for holes, cracks, or broken welds; tighten door hinges and wheel wind mounting bolts; and tighten stub axle set screw, hitch mounting bracket bolts, and hitch pin collar locking bolts.

- Inspect frame for cracks or broken welds.

- Perform lubrication and servicing in accordance with the manufacturer's recommendations.

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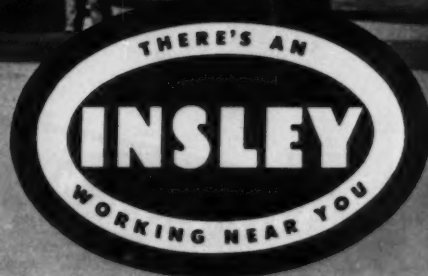
New 45 Ton Lorry Crane extends the INSLEY line

Versatility, performance, long life—these are the features of the new Insley 45. This new truck crane not only is rated at 45 tons—it *works* at 45 tons. What's more, the Insley 45 is "power matched" to capacity for maximum operating efficiency. The rugged components of the 45 stand up under the severest conditions for continuous "day in and day out" operation and bigger profits. Besides these features, here's a host of other advantages you'll find in the new Insley 45:

- Precision boom raising and lowering through planetary gears.
- Independent boom hoist.
- Safe, accurate load lowering with full load control.
- Floating gantry.
- Hydraulic counterweight removal.
- Pin (folding) boom connections.
- Wide choice of engines, with torque converter or fluid coupling.

INSLEY

45



See your Insley distributor today. Get all the facts on the new Insley 45. See for yourself how this versatile machine can lend itself profitably to your application.

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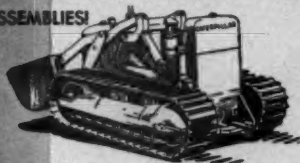
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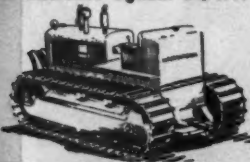
nuts, safest, surest way to lock track
pads on all CATERPILLAR TRACK
ASSEMBLIES!



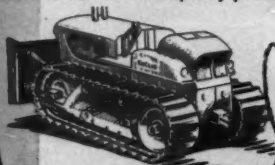
Be safe... be sure, with PAD-LOK nuts.
High Carbon steel, double heat-treated,
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over again. Unaffected by heat or cold.
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And, don't forget GROUSER STEEL.
Earnest cuts it to any length you require.
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TRUCKS... continued



LUBRICATION—Perform lubrication and
servicing in accordance with manufac-
turer's instruction. Use only the oils and
greases of the makes recommended.

1000-Hour Check

Make these checks in addition
to all those listed in the 100 and
500-hour checks.

- Inspect intake parts and piston rings; check compression pressures, crankcase pressure, exhaust back pressure, and air box pressure; inspect blower and clean blower screen; check fuel oil return rate; check crankshaft end play; test engine synchronization (twin-engine units).

- Check crankshaft end play and grease water pump and fan hub.

- Adjust front and trailer wheel bearings.

- Check air compressor unloading valve and clean compressor discharge valve.

- Clean compressor oil return lines and governor air strainer.

- Test safety valve pop-off pressure.

- On hydraulic system, check adjustment of relief valve and steering booster relief valve.

- Perform lubrication and servicing in accordance with manufacturer's recommendations.

2000-Hour Check

Make these checks in addition
to all those listed in the 100, 500,
and 1000-hour checks.

- Inspect axle planetary gears.

- Tighten generator and starter mounting, and starter solenoid holddown bolts.

- Inspect generator and starter brushes and commutators.

- Clean and adjust regulator.

- Perform lubrication and servicing in accordance with the manufacturer's recommendations.

Craftsmanship...

Does it really matter if a carrier frame has had a stress analysis... if all welds are cleaned and ground... if the best component parts are used? At Hendrickson, it *does* matter. Hendrickson engineers and craftsmen *never* take quality for granted. Because of this, Hendrickson customers can *always* take quality for granted.

HENDRICKSON Custom Carriers

are tailored for your operation. Each Hendrickson Custom Carrier is especially designed for the specific upper works and built to the crane manufacturer's specifications.

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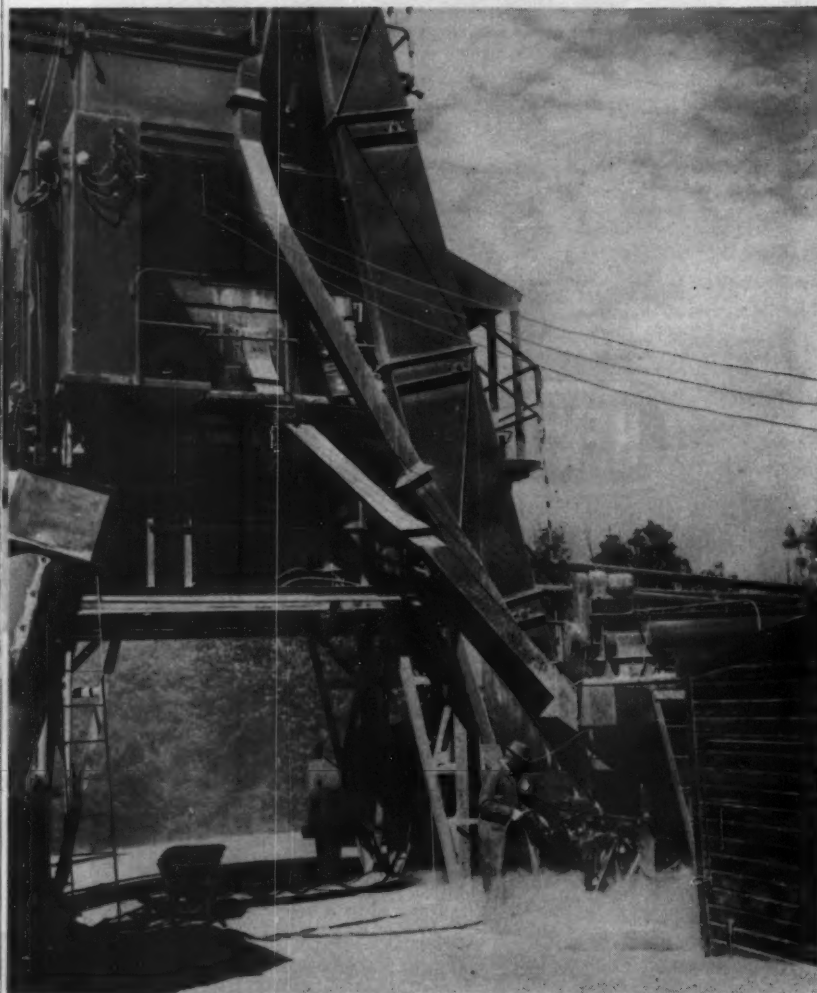




About the Author
C. E. (Chuck) GLENEY, Barber-Greene's general service manager since 1949, has been an equipment service expert with B-G since 1947.

An expert tells how to get maximum service from these costly machines.

ASPHALT MIXERS and



AT THE BOTTOM—Compressed air hosed to base of mix plant gets destructive dust out of crevices and ledges of foot shaft bearings on elevators where it gathers.

WHEN Benjamin Franklin wrote: "For want of a nail the horse was lost," he stated a truism that is as applicable to maintenance of modern construction equipment as it was to the horse.

The maintenance of asphalt mixing and paving equipment can be approached by considering the entire field as falling into three areas: (1) general considerations that apply to all equipment in this category; (2) special considerations that concern mixing plant equipment; (3) special considerations that involve the paving machines.

Some of the general considerations probably are applicable to all types of construction equipment. But the high cost of asphalt plant spreads makes it apparent that every maintenance operation is a major one. It's surprising that each is not followed more religiously.

In an anomaly that might be titled, "The Case of the Contractor's Cadillac," we find the first general consideration. This is that proper and careful operation of mixing and paving equipment is essential if the follow-up work of maintenance is to be effective. Many a contractor who never would allow a plant crewman to drive his \$6,000 Cadillac, will entrust to that crewman the operation of equipment that costs anywhere from \$15,000 to \$250,000. But a careless operator—a "hot-rod"—can be the first weak link in a chain of shoddy maintenance that leads to shortened equipment

AT THE TOP—Air jet also removes dust that gets into electric motors, gas and diesel engines, bearings, and parts of hydraulic system.



PAVERS

life and soaring maintenance costs.

To eliminate weak links from the maintenance chain, the contractor must enforce certain positive policies.

- One individual must be responsible for establishing and executing a preventive maintenance program. He must have both the responsibility and the authority to carry out his operations. His personal financial reward must be sufficient to attract and keep a man of experience, initiative, and ability. He must have enough helpers to do the job and a budget sufficient to pay them according to their worth.

It is equally imperative that sufficient time be allotted to the maintenance operations. The complaint of insufficient time to perform proper maintenance is brought to our attention more frequently than any other.

- He must maintain a check chart and schedule proper inspection, adjustment, lubrication, or replacement when required or recommended by the equipment manufacturer.

- A sufficient stock of expendable parts for all equipment must be maintained, properly housed and identified, ready for instant use. This should include all parts subject to normal wear and replacement. It is also essential to know where to get less commonly replaced parts—whether from the local distributor or directly from the manufacturer.

Here's a word of warning. The

purchase of substitute parts from sources other than the original manufacturer is of questionable advisability; the apparent savings may develop into additional costs through improper fit or wear on adjacent parts. Substitute parts, advertised as being "thicker" or "heavier" may indeed be that; but they may need to be "heavier" because of the use of less suitable materials. No reputable manufacturer seeks inordinate profit on the sale of repair parts; the user is very often getting just what he pays for when he buys "cheaper" parts.

- A complete set of tools must be on hand: wrenches, hammers, drifts, chisels, and a complete set of mechanic's tools, augmented, if possible, by appropriate cutting and welding gear.

- A complete stock of lubricants as recommended by the equipment manufacturer should be on hand and identified. Substitution of one type for another should be forbidden.

- The appropriate operating, maintenance, service, and repair parts manuals for all equipment should be on hand, filed and indexed for immediate availability when needed. Operating personnel should familiarize themselves with the manuals applicable to the equipment in their charge.

- Bad weather storage facilities, such as covers and tarpaulins, should be available when the equipment is shut down for any protracted period of time.

Asphalt Plants

Elements of maintenance more particularly applicable to asphalt mixing plants are related to the problems raised by heat, the abrasive effect of aggregate, and dust.

Heat, of course, is essential in asphalt operation, and its presence must be accepted. The effect of heat on lubricated parts may be minimized by observance of

manufacturers' recommendations as to lubrication.

Strange as it may seem, this major maintenance problem can be disposed of with this single sentence of recommendation. While this may involve stocking several types of special high temperature or high pressure lubricants their entire cost is only a fraction of the potential savings that can be realized in reduced maintenance.

The abrasive effect of aggregate in an asphalt plant, like heat, is an essential and expected element of operation. The undesirable effects, however, can be minimized.

If a weekly inspection is made of all plant equipment, paying special attention to all chutes and chute liners, screen cloths, conveyor belts, pugmill liners, paddle arms and tips, ducting, and dust collector cyclones, wear will be detected and replacement can be made before the worn part fails and causes auxiliary damage.

For example, if pugmill liners are allowed to wear so thin that they break through continued use can rupture even the pugmill shell. This is certain to cause serious damage to the mixer unit and, because the liner contains either hot oil or steam to heat the pugmill, there is always the chance of serious injury to the operator.

Similarly, pugmill paddle tips can be run until they simply wear through their bolts and fall off. Although worn knife-thin, these metal slugs are almost incredibly hard and can thoroughly jam a pugmill if caught between the liner and another paddle tip. They also can rupture a liner plate.

In the case of dust collector cyclones and ducting, spots that are allowed to wear through drastically reduce the collection efficiency and even reflect seriously in the combustion efficiency of the dryer. This, in turn, will reduce



2,600,000 lb

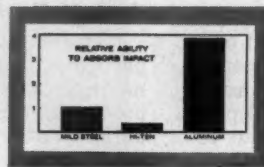
OF EXTRA PAYLOAD A YEAR WITH ONE ALUMINUM DUMP TRAILER

It's no wonder operators in an eastern Ohio area prefer aluminum dump trailers over the steel type by a margin of four to one. Take, for example, The Ferris Coal Company, of East Palestine, Ohio, which replaced one of its 12 conventional steel dump units with an aluminum frameless dump trailer. Hauling 40,100 lb of coal on two 120-mile trips per day, five days a week, this unit delivers 5,000 lb of extra payload with each trip. In a year's time, that adds up to 2,600,000 lb of extra payload for added profit. You can see why Ferris is already considering replacement of other dump units with aluminum dump bodies.

Perfection Steel Body Company designed and built this 24-ft frameless dumper of lightweight, high-strength Alcoa® Aluminum alloys. It has a capacity of 28 cu yd. Maintenance savings, thanks to aluminum's natural resistance to corrosion and denting, will add even more to its earnings.

The moderate price differential you pay for alumi-

num can usually be paid for in extra earnings in little more than a year. If you have not yet investigated the use of aluminum in your own dump body equipment, why not let us send you the names of other operators who are enjoying benefits like those described above? We'll include a list of leading manufacturers and your free *Dump Body Folder*. Write today to Aluminum Company of America, 1774-G Alcoa Building, Pittsburgh 19, Pa.



PROOF! Aluminum is tougher than steel! Dump bodies built of Alcoa Aluminum alloy can take three times as much impact as steel, at half the weight.



Your Guide to the Best in Aluminum Value

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THEN LUBRICATE—Manufacturer provides a lubrication chart that lists proper lubes for all moving parts.

ASPHALT MIXERS AND PAVERS... continued

plant capacity. These breaks, easy to patch when first observed, should be repaired without delay.

Modern asphalt design has greatly reduced the amount of dust present in the plant area, but poor plant housekeeping will permit what dust is present to build up until it can become a maintenance problem.

This dust represents a serious threat to electric motors, gas and diesel engines, bearings, and the hydraulic system. It is particularly serious on partially open chains that normally are lubricated. If dust is not frequently flushed out of the chains with solvent it can build up to a point where it causes serious chain stretch and whipping as the chain revolves. As this condition continues, the chain can climb the sprocket and break.

Dust build-up on the ground both from normal precipitation and from overflow can cause damage to foot shaft bearings on elevators. With excessively poor housekeeping these bearings not only operate 100% of the time buried in dust, but frequently are overlooked in maintenance because they are "out of sight, out of mind."

Some forward-thinking plant operators keep a compressed air supply and a hose available daily to "blow-down" the complete plant. This not only gets the dust out of the crevices and ledges where it normally builds up, but give the workman a chance to inspect the entire plant and check every moving part for wear.

Asphalt Pavers

Much that has been recommended for plant maintenance is equally applicable to pavers.

Time and personnel must be allotted to a thorough cleaning of the machine at the end of every day's operation. The finisher owner should insist that the feeders and drives, the tamper and drives, and the screed and spreading screws be sprayed thoroughly with an appropriate solvent, such as kerosene or diesel fuel, before the machine is "bedded down".

Again, this not only insures that all moving parts will be free of binding for the next day's operation, but also provides an opportunity for visual inspection of the parts to detect undue wear.

Any tendency to allow screed plates or tamper bars to be used until they are worn beyond the point where the manufacturer recommends replacement will prove false economy for the user. Excessively worn screeds or tampers lower the quality of the work being performed by the paver. Paver shut-down may follow; it also may involve plant shut-down until the paver is ready to go again. On a large plant, this may bring a loss upwards of \$250 an hour in stand-by pay to the crew and lost production.

Again, as in the case of asphalt plants, it is most desirable to have an adequate stock of parts that are subject to wear on hand.

To summarize, the essential elements of asphalt plant and finisher maintenance are: the time and the personnel to perform the maintenance; a close adherence to the manufacturers' recommendations in the maintenance of all units; good housekeeping in the plant area; and a policy that allows replacement or repair before any part has been run to destruction.

NEW

37.7 MPH

6-Wheel SPEEDPULL*



NOW

270 HP



C TOURNAPULL®



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*Trademark CP-2140-DC-1/2

NEW

from LeTourneau-Westinghouse

6-WHEEL

276 hp...20 yd heaped...37.7 mph



CHECK THESE IMPORTANT SPEEDPULL ADVANTAGES:

Easy-loading Fullpak® Scraper Design: Low angle loading, with wider entry for dirt. The fastest-loading scraper of all!

Hydrair* Suspension: Ride on air, not steel! Higher ground clearance, no axle-doing action. Fast, short turns!

Electric Controls: Instant-response motors control tailgate, apron, bowl lift. Easy-operating, low-cost maintenance!

Full-Power Steer: Sharpest turning-angle in the industry, with precision control. Feather-touch wheel, shockproof linkage!

Spot-Turn Brakes: Hand-lever actuates brake on either drive-wheel for immediate, sharp turns...to aid or replace front-wheel steer in soft going!

3,764 Sq In. Brake Surface: Biggest brakes in the industry for SURE stops. Also available: brake-saving Electrotarder!

Power-Transfer Differential: Automatically transfers power from spinning drive-wheel to wheel on better footing!

Free-Oscillation Hitch: Scraper can "twist" 30° right or left of prime-mover, 27° downward, and 25° upward!

Easiest to Maintain: Strongest frame; quickest accessibility of components; and only one lube point needs daily service!

For further details on the new C Speedpull contact your LeTourneau-Westinghouse Distributor.

Note: See
easy-load
scraper is
Power
announced
next page



SPEEDPULL*



PARADE OF PROGRESS

New 6-Wheel Scraper Added to LW Line of Earthmovers

PEORIA—A fast, high-production, six-wheel scraper is announced by the LeTourneau Company, pioneer manufacturer of rubber-tired earthmoving equipment. Named "Speedpull", the machine teams a 20-yd Fullpak scraper with a new 276-hp 4-wheel prime-mover, and offers speeds to 37.7 mph.

Designed specifically for top production on long-haul earthmoving jobs, Speedpull was given intensive on-the-job tests for 18 months before being placed on the market. Performance records on these jobs were outstanding, and the machine is expected to gain wide and immediate acceptance as a companion unit to LW's 4-wheel Tournapulls®.

Advantages of the Speedpull include revolutionary new Hydrair suspension, an exceptionally favorable power-to-weight ratio, "feather-touch" full-power steering, and new "spot-turn" brakes. In addition, the unit offers job-proven Tournapull features, including the world-famous LW power-transfer differential, electric control of scraper, and easy-loading Fullpak design.

Many advantages with Hydrair

Most unusual feature of Speedpull is Hydrair suspension, which mounts Speedpull's front wheels to pistons, to serve as giant shock absorbers. The machine rides on air, and no front axle is necessary. This makes for higher ground clearance and eliminates troublesome axle "dozing" action. The

no-axle feature permits shorter turns. Coupled with Speedpull's full-power steer, Hydrair permits the 41'2" machine to turn 180° in a space only 34' wide.

New "spot-turn" brakes are standard equipment. This steering system permits braking of either drive-wheel for fast skid-steer action, to supplement normal front-wheel steer in soft going. Braking surface on the Speedpull totals 3,764 square inches, largest in the industry. Auxiliary braking is available with the Electrotarder.

Maintenance costs of Speedpull will be unusually low. The frame is the strongest in the industry, with extensive use of new high-tensile-strength steels. There are only nine grease fittings on the prime-mover. Only one needs daily attention, and the other eight need service only once every 100 hours. And most major Speedpull components can be removed without disturbing other assemblies.

Power-plant for Speedpull is a Cummins diesel, rated at 276 horsepower. With only 336 pounds of total loaded weight per horsepower, the machine outstrips competitive machines in power-to-weight ratio. The 5-speed step-gear transmission is coupled to a two-speed transfer case, offering a total of 10 forward speeds and two reverse. The Speedpull has a large 16" double-plate clutch.

Complete specifications and performance data on Speedpulls are available at LW Distributors.

Note: Same easy-loading Fullpak scraper is used on V-Power C Tournapull announced on next page.



LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

*Trademark CSP-2144-DC-3

NOW



... for maximum efficiency in dirtmoving

C Tournapull... "Standard of the Industry"... is now available with the new GM 8V-71 engine... 270 horses of dynamic earthmoving power! Coupled with the "C's" simple, low-dead-weight construction, you get the best horsepower-to-weight ratio of any scraper in its class! The world's best medium-sized scraper now gives you extra power to lick the toughest loading condition, to provide quick acceleration, and assure top-speed hauling. Another big new feature of the V-powered C 'Pull* is a cost-saving "drop-out" transmission which can be removed easily without disturbing any other component.



Profit from these recent C 'Pull improvements:

Improved steering... new pressure-lubricated transmission... better brakes... new high-temperature insulation on all motors... larger diameter apron drum... adjustable side-thrust roller on tailgate... transmis-

sion oil-pressure gauge... new shock-mounted headlights... stronger bottom plate... better runner-rail reinforcement... new axle and inboard axle bearings... new converter tank filter... new, larger hoses.

PLUS all these job-proven Tournapull money-makers:

FULLPAK® scraper design: lower, wider, for better boil, fewer voids, bigger payloads... POWER-TRANSFER DIFFERENTIAL: lets 'Pulls operate in soft going that stops other scrapers... ELECTRIC CONTROLS: instant-response, pinpoint-accuracy control,

easy-to-operate, easy-to-maintain... BIGGEST BRAKES IN THE INDUSTRY: 3,764 square inches of brake surface... MORE MANEUVERABILITY: with kingpin steer... INTERCHANGEABILITY: switch trail-units behind prime-mover at low cost.



C TOURNAPULL®

270 HP

14 yd (struck) 20 yd (heaped)

**High horsepower, low dead-weight
Best power-to-weight ratio in its class!**



PARADE OF PROGRESS

This new V-power C Tournapull and the six-wheel Speedpull* announced on the previous pages are two more additions to an impressive array of new LeTourneau-Westinghouse earthmoving machines. They're part of LW's continuing program of product development to give you highest-production equipment at lowest ownership-operating cost.

Get in step! Your LeTourneau-Westinghouse Distributor has the answers to your questions about these new profit-builders. See him soon!

*Trademark CP-2154-DC-2



LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Hose the paver down after every day's work is the advice of this expert.

PAVERS

WATCHING a paving operation on a highway or airport project is a fascinating thing. The in-and-out movement of large batching trucks, the transformation of aggregates, cement, and water into a workable mass of concrete, the rhythmic and relentless operation of the finishing machines are all dramatic examples of mechanical efficiency that can hold the eye entranced for hours on end.

One fact will soon stand out to the casual observer as well as to the experienced construction man. The paver is the most important machine in the paving train. If it stops running, the entire job stops, idling a large crew of men and a number of machines.

Because the paver is so important, proper paver maintenance becomes the watchword on the job. As simple as it sounds, the most important item in proper paver maintenance is cleanliness. To mix a batch of quality concrete in the minimum time, all parts of the paver must be kept free from the build-up and accumulation of concrete. This includes the mixing compartments inside the drum and the blades and buckets. It also includes the drum heads, the roller paths, the control rods and levers, the transfer and discharge chutes, and the charging skip.

The secret of keeping the paver clean is to hose the machine down at the end of each working day, taking special care to make sure the entire paver, inside and out, is free of concrete.

The water system of the paver must be kept free of foreign materials. A paver uses a lot of wa-



KEY UNIT—The paver is the most important machine in the paving train. Maintenance is essential to keep unit producing steadily all day and prevent shutdown of entire train.

ter, and often the source of the water is not entirely dirt free. To keep dirt, sand, and other foreign material from getting into the measuring portion of the water system, it is absolutely essential that adequate screens be used and that these screens be kept clean.

Lubrication

Like any other piece of construction equipment, the paver must be properly lubricated. Bushings should be greased after every eight hours of operation, and anti-friction bearings should be lubricated once a week or after 50 hours of operation.

All brakes and clutches should be checked periodically for proper adjustment. Cables should be checked daily. The operator must be constantly on the alert to spot

trouble in time to prevent a shutdown. The paver should always be in condition to work throughout the day without interruption.

In some parts of the country where the construction season is short because of cold weather, pavers work steadily seven days a week during the paving season. Then operator and oiler must take advantage of any shutdown of the job to make major adjustments and check-ups. Normally, weekends provide time for checking the gear cases for proper lubricant level, tightening bolts, and other adjustments.

A final word of advice: Keep the manufacturer's instruction book close at hand. Frequent reference to this carefully prepared booklet will enable the contractor to keep his paver running at top efficiency.

About the Author



WALTER AHRENDT is a Field Service Representative of the Koehring Co. During his 33 years with the company, he has covered the entire United States and Canada checking paver servicing in the field.

BIGGEST

in the 3/8-yd. field!

Bold new Series 350 BANTAMS

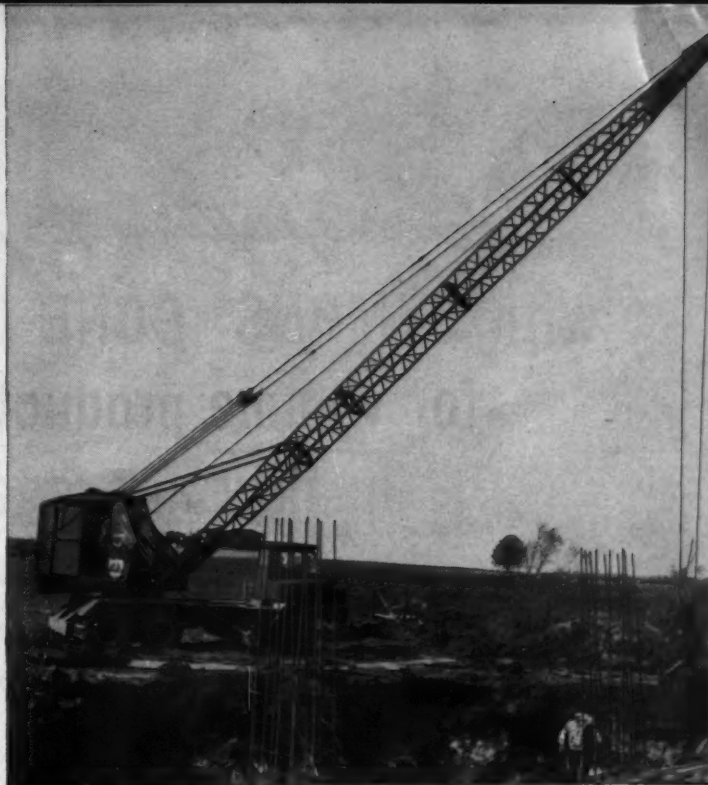


- Capacities to 11 tons
- Back hoe digging depth to 18' 10"
- Over 25 job-matched options

These big new BANTAMS move farther ahead than ever—in total capacity to work more, do it better and finish it faster. That goes for any assignment you give it throughout BANTAM'S amazing job range—working with any attachment; mounted on carrier, crawler or self-propelled.

Indeed, these all-new BANTAMS will make you marvel at how expertly high performance and high production are combined in such a compact, practical-sized rig—a machine of such get-around ease that you profit from time savings to and from the job as well as on the job!

For each dollar invested, there is nothing in its class that will bring such high profit returns so consistently over the



years. BANTAM's big-rig features and exclusive engineering advantages assure this.

Just look at all that's BANTAM-new!

New fleet of four BANTAM-built carriers for a perfect match to your job and price needs . . . new, high-strength booms up to 70' . . . new 30% heavier trunnion base design . . . new choice of three boom hoists . . . new, precision power load lowering . . . new 2-speed transmission . . . new torque converter option . . . new, deeper digging back hoe . . . new, increased line pulls . . . new, 100% use of anti-friction or roller bearings . . . new, added power—gasoline or diesel . . . and many, many more news-making BANTAM benefits.



BANTAM CR-350 SELF-PROPELLED—the up-and-coming new tool for contractors, pit operators, material handlers. Now has 4 x 4 drive option . . . automotive-type power steering . . . independent travel, swing, hoist . . . higher travel speed. Maximum stability over end or sides with 11-ton capacity.



World's largest
producer of
truck crane-excavators

BANTAM C-350 CRAWLER — all-new, all-powerful! Has new, more rigid car body and bolt-on side frames . . . 2-speed, full-reverse travel transmission . . . new optional in-cab digging lock . . . widest choice of crawler features for specific needs, including wide base extensions, standard or long side frames . . . high-clearance side rails. New back hoe digs 18'10". Works with all of BANTAM'S 11 new rapid-change attachments. Capacity to eight tons.



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work ability and value...
COUPON BRINGS YOU THE PROOF!**

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Name Title

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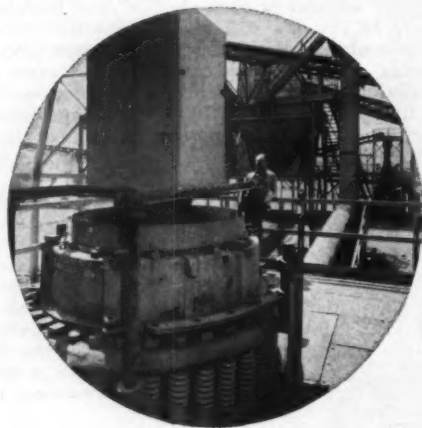
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Make more profit on the jobs ahead...
with SYMONS® CONE CRUSHERS
for volume production of
quality aggregate

Here is a dramatic example of the vast contributions to the progress of mankind being made by the construction industry. In modern engineering and huge construction projects such as this, specification aggregate has assumed an increasingly important role. To meet the constantly growing demand for vast tonnages of quality aggregate used in concrete and bituminous highways, Symons Cone Crushers are today, more so than ever before, the first choice of leading producers throughout the world. Symons Cone Crushers are also used in sand preparation operations.

For in aggregate and sand production . . . as in all of the great ore and industrial minerals operations the world over . . . no record equals the performance of Symons Cone Crushers that have so consistently produced, economically and efficiently, great quantities of finely crushed product resulting in higher profit per ton per hour.

Before you submit your next bid, get full information about Symons Crushers.



FOR STATIONARY PLANTS

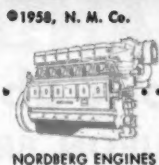
Symons Cone Crushers are the choice of leading contractors and producers for primary, secondary and finer reductions in all types of aggregate operations. Available in both Standard and Short Head types, Symons Cones are built in sizes from 22" to 7' in diameter, for capacities from 6 to 900 or more tons per hour.



FOR PORTABLE PLANTS

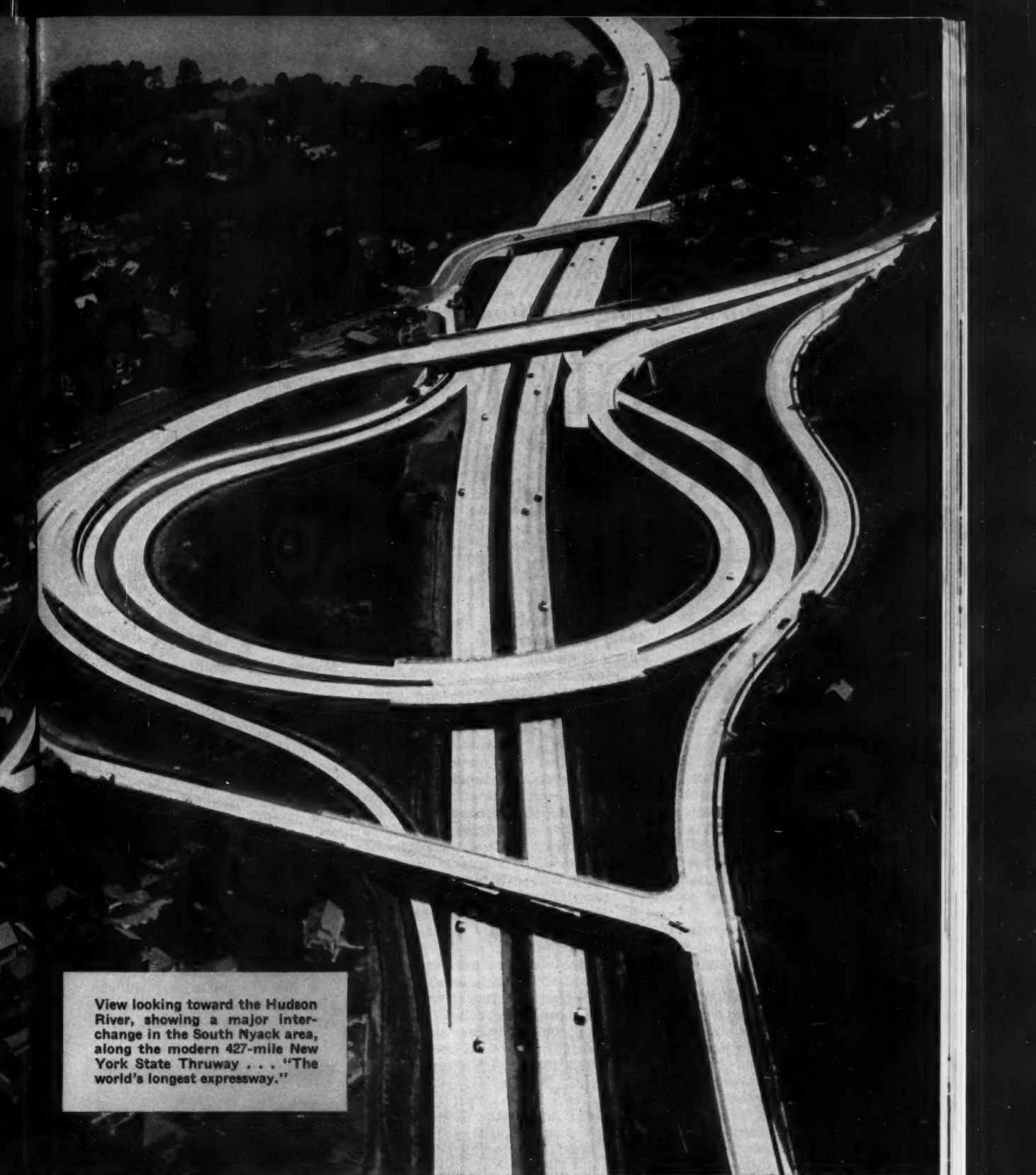
Symons Cone Crushers are being used in increasing numbers for portable and semi-portable crushing plants. Illustrated is a typical Cedarapids Intermediate Scalping Unit, using a 4-ft. Symons Cone Crusher. Unit is serving a large Midwest sand and gravel producer.

SYMONS . . . a registered Nordberg trademark known throughout the world.



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View looking toward the Hudson River, showing a major interchange in the South Nyack area, along the modern 427-mile New York State Thruway . . . "The world's longest expressway."

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SAN FRANCISCO • TAMPA • WASHINGTON • TORONTO • VANCOUVER • GENEVA • JOHANNESBURG • LONDON • MEXICO, D. F.

An expert tells how to keep a tractor shovel in top operating condition.

TRACTOR SHOVELS



About the Author

GUST J. SCHWANKE, manager of parts and service since 1958, is a 16-year veteran with Clark Equipment Company.

YEARS of engineering experience, the finest materials available, and skilled manufacturing methods go into the construction of tractor shovels. They are important to the fast handling of large quantities of raw materials, so a great deal of attention must be paid to their proper maintenance.

Most construction men from time to time do carry out the obvious maintenance requirements. But the man who owns construction machinery would do well to make sure that each operator and maintenance man knows what to look for, where to find it, and when to carry out the various maintenance operations.

A study as to causes of failures and breakdowns shows that in most cases they result from wear, shock, overload, or a combination of all three. Failures due to wear can be prevented and reduced by proper lubrication, adjustment, and replacing of worn parts before they cause failure of other parts in the unit.

Failures due to shock can be

prevented by proper operator techniques and timely checks to be sure all parts of the unit are securely tightened to eliminate vibration and fatigue.

Failures due to overload can be prevented by stopping overload practices. Stresses created by carrying overloads beyond the capacity for which the machine was designed can only result in premature failure.

These factors must be taken into consideration in establishing a well-planned preventive maintenance program. A check list based upon manufacturer suggestions and individual field operations is the easiest way to get the job done right.

Check lists generally are divided into groups of lubrication and service operation to be performed at intervals. These are daily or shift, weekly or each 50 hr of operation, and periodically such as every 500, 1,000, and 2,000-hr intervals. Typical of such a list are recommendations for maintenance of Michigan tractor shovels.

Daily Check



Check engine oil

- Check engine oil level and add oil to maintain level at the "full" mark on dipstick.

- Empty, clean, and refill air cleaner cup with same grade oil as used in engine. This is important. Under extremely dusty conditions this unit may require cleaning several times each day. Clogged air cleaners will increase fuel consumption and lower power output as well as cause expensive engine overhaul due to dirt.

- After cleaning oil cup, the central tube should be cleaned

Weekly Check

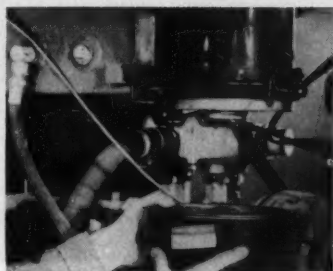
Maintenance required at 50-hr intervals takes more time than the daily lubrication and inspection but is probably the most important operation in the prevention of abnormal wear. The following items should be checked and adjusted or repaired as required in addition to daily checks.

- Drain and refill engine crankcase with proper grade lubricant as specified by the engine manufacturer. Machine should be level with engine at normal operating temperature when oil is drained. *Never* flush with kerosene; it provides insufficient lubrication and kerosene remaining in the engine dilutes the oil.

- Remove and discard sludged oil filter element from engine and replace with new element. Filter



Replace oil filter



Empty air cleaner cup

by passing a clean rag through the tube. Never under any circumstance use waste.

- Check water or anti-freeze solution in the radiator. Use water with low mineral content.

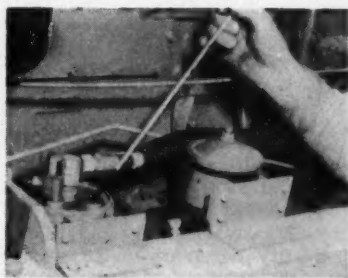
- Fill fuel tank with clean fuel handled in clean containers. Use a good brand procured from a reliable company. Gasoline of 75 octane minimum or No. 2 Diesel fuel oil should be used as applicable.

- Check level of electrolyte in batteries and add only distilled

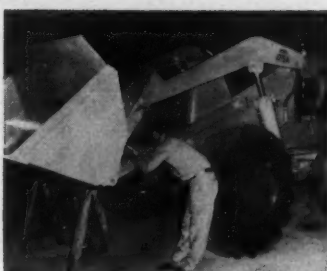
case should be thoroughly cleaned. Run engine a few minutes and check for leaks. (Due to variety of optional engines offered it is recommended reference be made to applicable engine operators and service manual for maintenance procedures, lubrication specifications, and intervals at which they should be performed.)

- Tighten all hose clamps and check all hoses and pipes between air cleaner and engine for cracks or leaks. Failure to correct existent cracks or leaks will permit dust-laden air to by-pass the air cleaner entering directly into the engine. Serious and costly damage to the engine will result.

- Check fan, compressor, and generator belts for wear, and frayed or cracked spots. Adjust



Check oil in separator tank



Check bucket operation

water to maintain level at $\frac{3}{8}$ -in. to $\frac{1}{2}$ in. above plates.

- Clean battery terminals and check for tightness. A light coating of petrolatum or vaseline will help prevent corrosion.

- Check and maintain hydraulic oil reservoir supply to level indicated on sight glass in rear. Bucket must be resting on ground and engine shut off when checking oil level. Use only a premium grade hydraulic oil when necessary to add oil.

- Check fluid level of trans-

mission for proper tension if required.

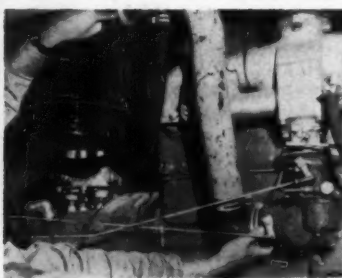
- Check all fuel lines, fuel pumps, filters, and shut-off cocks for leaks, then correct where necessary.

- Open drain cock at bottom of filters, when provided, and drain off accumulated water and sediment.

- Check radiator, hoses, oil cooler, water pump, and drain cocks for leaks and correct where necessary.

- Check strength of anti-freeze solution, when used, with hydrometer.

- Check oil reservoir, valve, pumps, cylinders, all hose lines, and connections for leaks, correcting where necessary. All hoses should be checked for abrasions that could result in ruptures of



Tighten hose clamps

mission and torque converter by removing level plug in transmission case. When necessary to add, use only Type "A" Automatic Transmission Fluid filling through filler plug in torque converter to bring fluid to level of plug in transmission case.

- Open drain cock at bottom of air reservoir on units equipped with air brakes and bleed off accumulated condensation.

- Check tire pressures and inflate if necessary.

- All tires should be checked for cuts, bruises, fabric breaks, and excessive or uneven wear.

- Lubricate chassis using a good grade of semi-fluid general purpose chassis lubricant, grease all chassis points by use of grease gun.

same. Replace hoses found in this condition.

- Check pressure relief valve for proper setting using a hydraulic gauge of at least 3000 lb capacity for this purpose.

- Check torque converter, transmission, all hose lines, pipes, and connections for leaks, then correct where necessary.

- Check shifting linkage for binding or tightness.

- Check clutch pressures in each speed and direction with hydraulic gauge of at least 350 lb capacity. Where recorded pressures fall below or near minimum of specification, further investigation as to cause should be carried out to determine cause therefore. Early detection of cause for malfunctioning clutch will result in less expensive repair than when wear is permitted to proceed to point of requiring replacement of all clutch components.

- Check oil level in both front and rear differentials by removing level and filler plug. Check oil level in planetary wheel hubs by rotating wheels until level plugs are in required position as indicated on thrust caps. Maintain oil to level of plugs adding only SAE 90 Extreme Pressure Gear Lube if required.

continued on next page

TRACTOR SHOVELS... continued

- Tighten wheeling mounting nuts with torque wrench.

- Check steering pump, valve, booster cylinders, and oil lines for leaks. Correct where necessary.

- Check pressure relief valve for proper setting with hydraulic gauge of at least 3000-lb capacity.

- Check the level of lubricant in steering gear housing, adding only SAE 90 straight mineral oil.

- Check level of fluid in master cylinder of hydraulic brakes, adding only Wagner 21-B Heavy Duty Brake Fluid when required.

- Check level of oil in separator tank (only on units with vacuum assist brakes) and add oil if required according to manufacturer's recommendation.

- Using hydrometer check each battery cell for specific gravity. Reading should register between 1.230-1.260 with variance

between any two cells of no more than 25 gravity points (.025). Variance greater than this indicates trouble either in the electrical system or the battery itself.

500-Hour Check



Replace transmission filter

All daily and weekly checks should be performed in addition to the following operations:

- Tighten all engine mounting bolts or nuts and replace any broken or missing bolts. (Due to a variety of optional engines it is recommended that reference be made to applicable engine operators and service manual for maintenance procedures, lubrication specifications, and intervals at which they should be performed.)

- Drain and refill torque converter and transmission. This should be done when fluid is hot (180-deg to 200-deg F) and in the following order:

- Remove drain plugs from converter and transmission and drain thoroughly. Remove transmission sump well and screen, clean thoroughly, and replace with new gasket.
- Remove and replace filter element in converter and transmission filter assembly. Clean filter case.
- Using only Type "A" Automatic Transmission Fluid, refill through converter filler opening until oil comes up to level of level plug in transmission case.
- Re-install filler and level plugs then run engine at 500 to 600 rpm for two minutes to prime converter.
- Recheck level of fluid in transmission and add quantity necessary to bring up to level plug hole.

continued on page 175

More than 40,000 DIESEL ENGINES are equipped with VERTICALLY driven ROOSA MASTER fuel injection pumps

The vertical pump drive arrangement, pioneered by Hartford Machine Screw Company, is a revolutionary and exclusive ROOSA MASTER feature. The vertical adaptability has saved manufacturers thousands of tooling expense dollars by permitting standardization of engine blocks for gasoline and diesel engines.

More than 40,000 vertically driven ROOSA MASTER pumps in satisfactory field service are proving that the vertical application to existing and new engine designs is practical and sound.

VERTICAL DRIVE ADVANTAGES: • Simplicity of installation • Easy accessibility • Shorter injection lines for better performance • Lower cost • Makes available space for other accessories.

HARTFORD MACHINE SCREW CO.
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ROOSA MASTER



You can depend on the diesel that depends on ROOSA MASTER

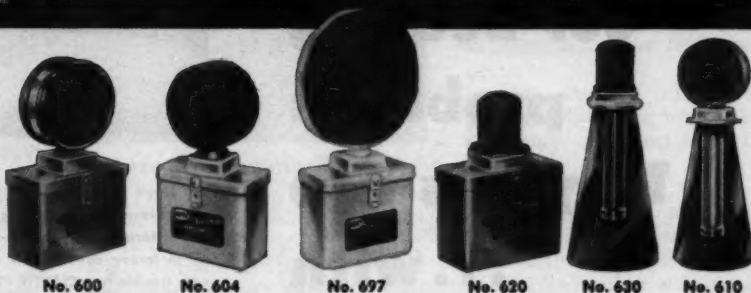
On **YOUR** jobs . . . play it **SAFE** . . . with the

DIETZ 3-WAY Hazard Warning System!

Use DIETZ VISI-FLASH LIGHTS

to alert the
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Brightest, safest, most trouble-free flashers on the market. Warn: "Danger Ahead."

Use DIETZ LANTERNS

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in relation to the
driver's position:

2 →



Show exact location, shape, extent, and boundaries of hazard area. Burn up to 100 hours.

Use DIETZ TORCHES

to guide driver
around the hazard:

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Fully illuminate the danger in every weather. Burn up to 48 hours on low cost kerosene.

Go **DIETZ**
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Hazard Warning Lighting Manual.



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Mr. Albert Isbell, Shop Superintendent, says:

**"We solved
our bearing
problems
10 years ago
...with**



The Isbell Construction Company owns and maintains over 1500 Diesel units operating in temperatures ranging from 40° below zero to 130° above—from 1000 to 9000 ft. elevation—all in heavy construction work—and giving longer service with trouble-free CLEVITE 77 bearings.

GLEVITE 77!"

Covering five western states, Isbell specializes in mining construction and general heavy construction. The job shown is a U.S. Highway 60 widening and aligning job, south of Salt River Canyon. They have been getting as much as 8,000 hours on Diesel engines before overhauls. Albert Isbell says: "We had trouble with bearing performance ten years ago. We had to have a bearing that would stay on the job—we found it in Clevite 77. Now, we use nothing else."

Fleet operators and engine rebuilders everywhere have learned that Clevite 77 bearings are the highest duty bearing available—anywhere. Patented tri-metal construction makes possible more corrosion-resistance, greater fatigue strength, superior running surface.

On your next engine overhaul—specify the best—specify Monmouth Clevite 77 bearings—available at all N.A.P.A. jobbers.

Monmouth

**ENGINE
BEARINGS**

CLEVITE SERVICE: Cleveland Graphite Bronze • Division of Clevite Corporation • Cleveland 3, Ohio



The words Monmouth, Clevite and Micro are registered trade marks of Clevite Corporation.

TRACTOR SHOVELS...continued

500-Hour Check...continued

- Tighten converter and transmission mounting bolts or nuts. Replace any broken or missing bolts.

- Tighten front and rear driving axles to frame mounting bolts.

- Lubricate three points on each propeller shaft. Use a hand grease gun, a good grade of semi-fluid general purpose chassis grease and apply sparingly.

- Tighten propeller shaft flange and universal joint bolts and check for loose or worn spider and bearing assemblies.

- Check ball joints in tie rods and drag links in steering system for looseness. Adjust as required.

- Check and tighten ball studs in steering arms and tie rods.

- Check and re-adjust Pitman arm stops. Pitman arm should strike the stops slightly before steering arm strikes stops on axle.

- Check travel of brake chamber push rods and adjust brakes if necessary. Push rod travel



Tighten axle mounting bolts

should be kept at minimum without brakes dragging.

- Drain and refill oil separator tank in units with vacuum assist brakes using these engine oils: 32-deg F and above—SAE 30; 0-deg F to 32-deg F—SAE 10W; 0-deg F and below—SAE 5W.

- Check and adjust parking brake as required.

- Check all air lines for leaks. With air supply at operating pressure apply thick soapy water with brush to all lines and connections. When checking line be-

tween brake treadle valve and brake chambers, be sure treadle valve is depressed to provide air pressure in these lines. Presence of air bubbles indicates a leak.

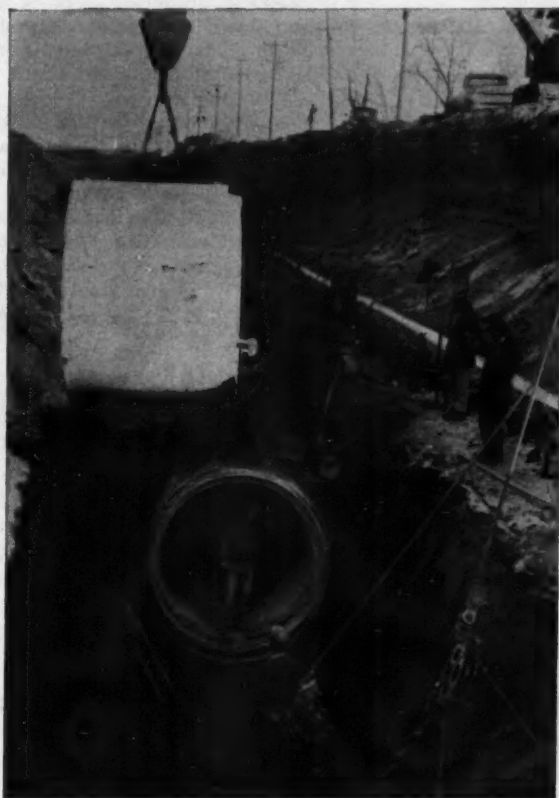
- Visually check all electrical wiring for worn or cracked insulation and loose terminal connections.

- On chassis, inspect bucket cutting edges for wear. Replace as required. Inspect bucket stops for wear.

- Inspect bucket, boom, guide bar, and frame structure for cracks or breaks in the welds. Any such faults should be remedied at once. Electric arc welding is recommended for all chassis welding.

- A general check and tightening of bolts and nuts retaining counterweight, grill, shrouding, seat support, radiator, hood, steering column, reservoir, valve, filters, and the like should be made. Replace any broken or missing bolts.

continued on next page



STANG LOWERS THE WATER TABLE 20 FT. IN -15° WEATHER

Sub-zero weather, yet business as usual—thanks to the reliability of a Stang Wellpoint System. In any weather, under all conditions, you can depend on Stang engineered dewatering systems. Call on the John W. Stang Corporation next time you have a dewatering problem. They're first in engineering, first in equipment, and first in service.

PROJECT: STORM DRAINS FOR MINNESOTA STATE HIGHWAY DEPT., BLOOMINGTON, MINNESOTA. CONTRACTOR: BARBAROSSA & SONS, INC., ST. CLOUD, MINN.

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Engineers and Manufacturers of Dewatering Equipment,
Wellpoint and Pumping Systems, Dewatering
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TRACTOR SHOVELS... continued

1000-Hour Check

All daily to 500-hr checks should be performed in addition to the following operations.

- Drain and refill differentials and wheel hubs in both front and rear axles. Refill through differential and wheel hub filler openings; bring lubricant up to respec-

tive level plugs. Use only SAE 90 Extreme Pressure Gear Lube.

- Drain and flush entire cooling system. Refill using water of low mineral content. Be sure to add permanent type anti-freeze solution if air temperature is 32-deg F or lower, or when there is danger of water freezing in cooling system.



Drain wheel hubs

WELDERAMA YEAR AT MARQUETTE



The Answers to Your Gas Welding Equipment Needs in 32-Pages

This new 32-page MARQUETTE Catalog will be your handiest reference file on all oxy-acetylene welding and cutting equipment and supplies.

Fully illustrated, it provides complete information, features and sizes on the following products: The complete line of MARQUETTE torches as well as the range of welding and cutting tips available for each. These torches cover all ranges of welding applications, including heavy, medium and light duty, soldering and continuous heavy duty cutting.

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2000-Hour Check

Perform all daily, 50, 500, and 1000-hr checks in addition to the following operations. Again, due to variety of optional engines it is recommended that reference be made to applicable engine operators and service manual for maintenance procedures, lubrication specifications, and intervals at which they should be performed.

- Drain, thoroughly clean, and refill hydraulic system. Replace filter element in steering system filter assembly. It is recommended all cylinder assemblies be removed, disassembled, cleaned, and packing renewed. All hose lines and piping should be cleaned and blown out. Use only premium grade hydraulic oil having rust and oxidation inhibitors and anti-foam agent.

- Drain oil separator tank in units with vacuum assist brakes and remove with oil lines. Flush thoroughly with gasoline to remove sludge and foreign material. Refill with these engine oils: 32-deg F and above—SAE 30; 0-deg F to 32-deg F—SAE 10W; 0-deg F and below—SAE 5W.

Useful Information

These *Construction Methods* reprints contain valuable information for contractors.

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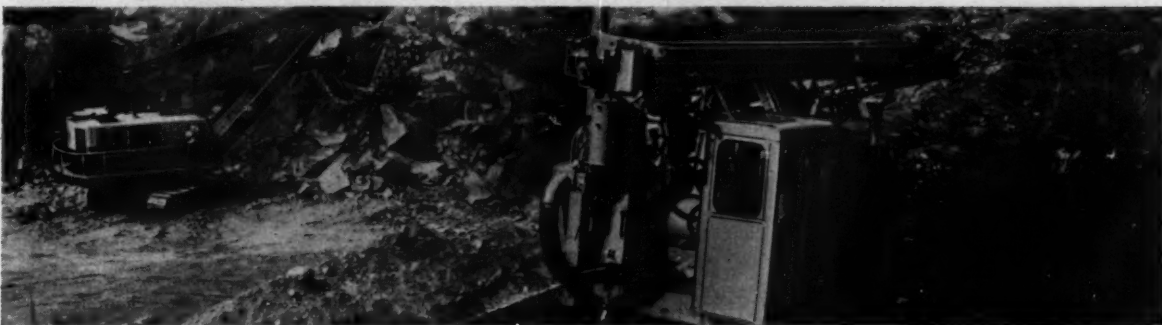
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(20 TO 1650 H.P. IN ONLY 3 CYLINDER SIZES)

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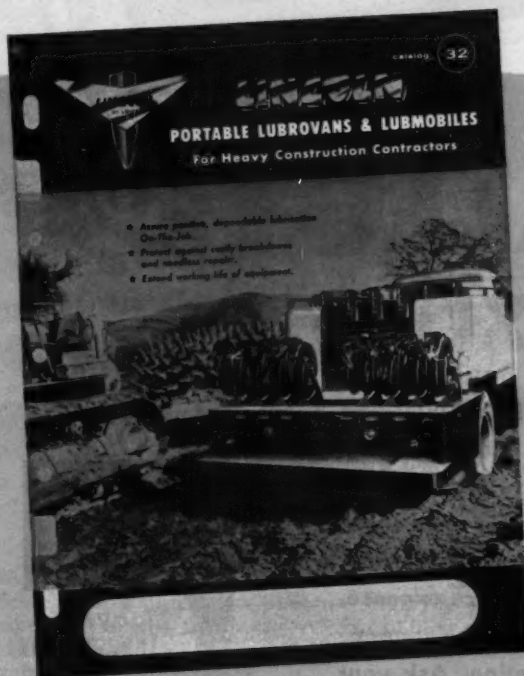
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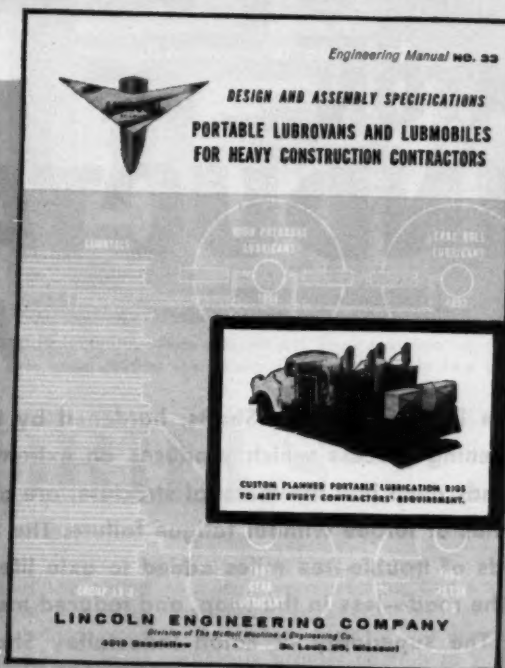
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About the Author



ARTHUR WALLACE is a design engineer with the Gardner-Denver Company. He joined the company in 1951. He is a graduate of the University of Denver with a B.S. in Mechanical Engineering.

*Inspection of parts
for excess wear
prevents breakdown,
says service expert.*



FOUR GROUPS—Parts of a rock drill break down into four groups. Each group requires special attention to stand up to hard service.

ROCK DRILLS

MAINTENANCE of the modern rock drill is a problem of simple inspection and balancing the remaining useful life of parts against their replacement cost.

Let us assume we have before us the parts from a typical rock drill. These can be placed in four groups: the percussion group, the rotation mechanism, the chuck parts, and other parts.

Percussion Group

The percussion group consists of the cylinder and the piston hammer. The piston hammer receives most of its wear from cupping on the striking face.

Cupping may be repaired by grinding, but it must be done with care to avoid burning. The surface should be smooth and absolutely square. The number of times a piston hammer may be refaced is limited by the depth of the case hardening. As a general rule, it is possible to remove up to 1/16 in. from the striking face with no ill effects.

The splined area of the piston hammer is subject to wear depending upon the lubricant used and the rotation loads. High loads or poor lubricants result in fine scoring cracks at right angles to the flutes along the driving side. Extreme loading will result in

more severe cracking and a typical blue burned color on these surfaces. Any cracking that is noticeable is usually enough to justify discarding the part. At this stage, scoring cracks grow quite rapidly into complete breakage.

A black deposit under the head



CUPPING—Careful grinding often will repair cupping damage to the striking face of the piston hammer. But depth of case hardening limits grinding to about 1/16 in.



SCORING—Extreme loading along with inadequate lubrication results in a burned blue color and fine scoring cracks at right angles to flutes along sides of hammer.

of the piston hammer indicates "dieseling." This is usually the result of allowing the drill to run at full throttle while pulling stuck drill steel. The oil burned and deposited on the piston hammer can no longer provide lubrication, and scoring in the cylinder and on the head and flutes of the piston hammer often results. While not too serious in itself, the black deposit is a good indication of possible damage of the parts.

Checking the cylinder and piston hammer for wear is done by holding the cylinder in a vertical position. The hammer is coated with light oil and dropped in from the top. The air cushion should be sufficient to stop the hammer without a severe metallic contact.

Rotation Mechanism

The rotation parts consist of the rifle bar, the ratchet ring, the pawls, and the pawl springs.

The splined area of the rifle bar, like the piston hammer, is subject to wear depending upon the lubricant and the rotation load. However, because of its smaller size, the pressure of the splines of the rifle bar is greater. The rifle bar should be replaced if the cracks are noticeable.

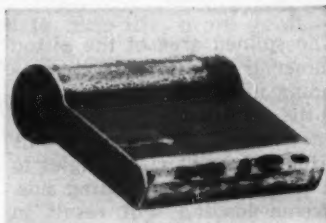
Erratic action results from neglecting the ratchet mechanism. Insufficient pawl spring pressure, brought about by wear or dirt in the air line, starts rounding of the corners of the pawls. Once rounded, the pawls tend to jump out of the ratchet ring teeth and these, too, become rounded. The pawl springs should be replaced at the first sign of shortening. Pawls should be reversed or replaced as they become rounded. Once damaged by rounding, the ratchet ring should also be discarded.

Chuck Parts

The chuck of the rock drill is subject to more wear than any of the other drill parts. Replacing worn chuck bushings controls the



AIR CUSHION TEST—Workman drops piston hammer, lightly coated with oil, into cylinder to check for wear. Air cushion should prevent severe metallic contact.



ROUNDED PAWLS—Insufficient pawl spring pressure causes rounding of pawls. Rounded pawls should be reversed or replaced, pawl strings always kept tight.

cupping of the striking face of the piston hammer and reduces breakage of water tubes. Normal wear causes "bell mouting" of the liner bore. The bore should not be allowed to grow beyond 1/16 in. over the original dimension.

The thrust face of the chuck liner also bears watching, particularly in lugged steel chuck constructions. Here, wear on the face contacting the lug occasionally is more rapid than in the bore. Greater life for the liner may be had by removing the liner and indexing it 90 deg. before reassembly. Wear on this face should be limited to 1/16 in.

Other Parts

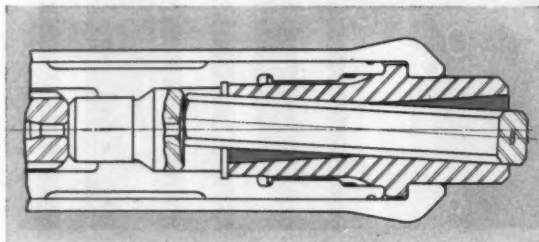
The retaining devices for the drill rod, in the case of collared chuck constructions, vary so much in design that specific instructions are impossible. But the parts should be inspected periodically. If looseness is present, replacement should be made before more extensive damage develops.

The automatic valve parts usually enjoy a long life. However, they should be carefully inspected for plugged holes each time the drill is torn down. Wear on the valve seating surfaces is most noticeable by increased air consumption of the drill. Here again, the conditions of the operation and the air supply available vary the amount of wear permissible with each operation.

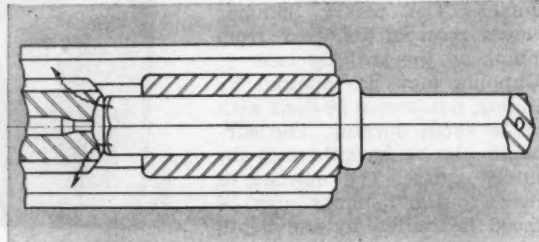
Reassembly

Before putting the drill together, it is good practice to coat all internal parts with rock drill oil. The final act of tightening the side rods is an important one. Uniform tightening is necessary to prevent overstressing the ears

continued on page 185



BELL-MOUTHED CHUCK—Normal wear causes bell-mouthing of the chuck liner bore. Misalignment of drill steel results in cupping of hammer. Growth in bore size should be limited to 1/16 in.



CHIPPED HAMMER—A standard size shank and new chuck parts combined with a cupped piston hammer results in chipping at the edges of the hammer face. Arrows show path of eventual breakage.

16000
85 - 130 KW

21000
125 - 200 KW

This Allis-Chalmers 16000 diesel generating set provides electric power for motors on a crusher operating near Great Falls, Mont. Primary

power source for the crusher is an Allis-Chalmers 21000 turbocharged diesel power unit, companion to the 16000.

NEW



DIESEL GENERATING SETS WITH BRUSHLESS GENERATORS

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Allis-Chalmers manufactures and stands behind all four major components that comprise these *complete* units — the modern diesels, the proved brushless generators, the rapid-response regulators and the switchgear. This means coordinated engineering, matched performance, undivided responsibility — an Allis-Chalmers exclusive.

2. Fast starts — Fuel savings

The modern diesels, with their unique, controlled combustion, start and pick up loads in 4 to 10 seconds. They save fuel, too. The 21000, for instance, saves 8½ to 27% in fuel over other diesels in its class. That's 1 to 2½ gal. of fuel in every 10!

3. Precisely regulated power

The new Allis-Chalmers magnetic amplifier type static voltage regulator has no moving parts or contacts. No parts to burn or wear. It has unequalled fast response to sudden

changes in load. Precise power regulation protects sensitive apparatus, easily picks up heavy motor starting loads.

4. Brushless generator has new simplicity

There are no slip rings, no brushes, no commutators to wear or to spark. Newly developed, non-aging silicon rectifiers rotate with the armature and replace the slip rings, brushes and commutator. Brushless generators are ideal for operation in dusty areas or in corrosive or explosive atmosphere — provide unequalled electrical reliability.

5. Fast, easy unit installation

These sets are simple, unit-type, self-contained. They are mounted on husky skids — no special foundation is required, no danger of misalignment. Electrical connections are simplified, to speed installation and reduce related costs.

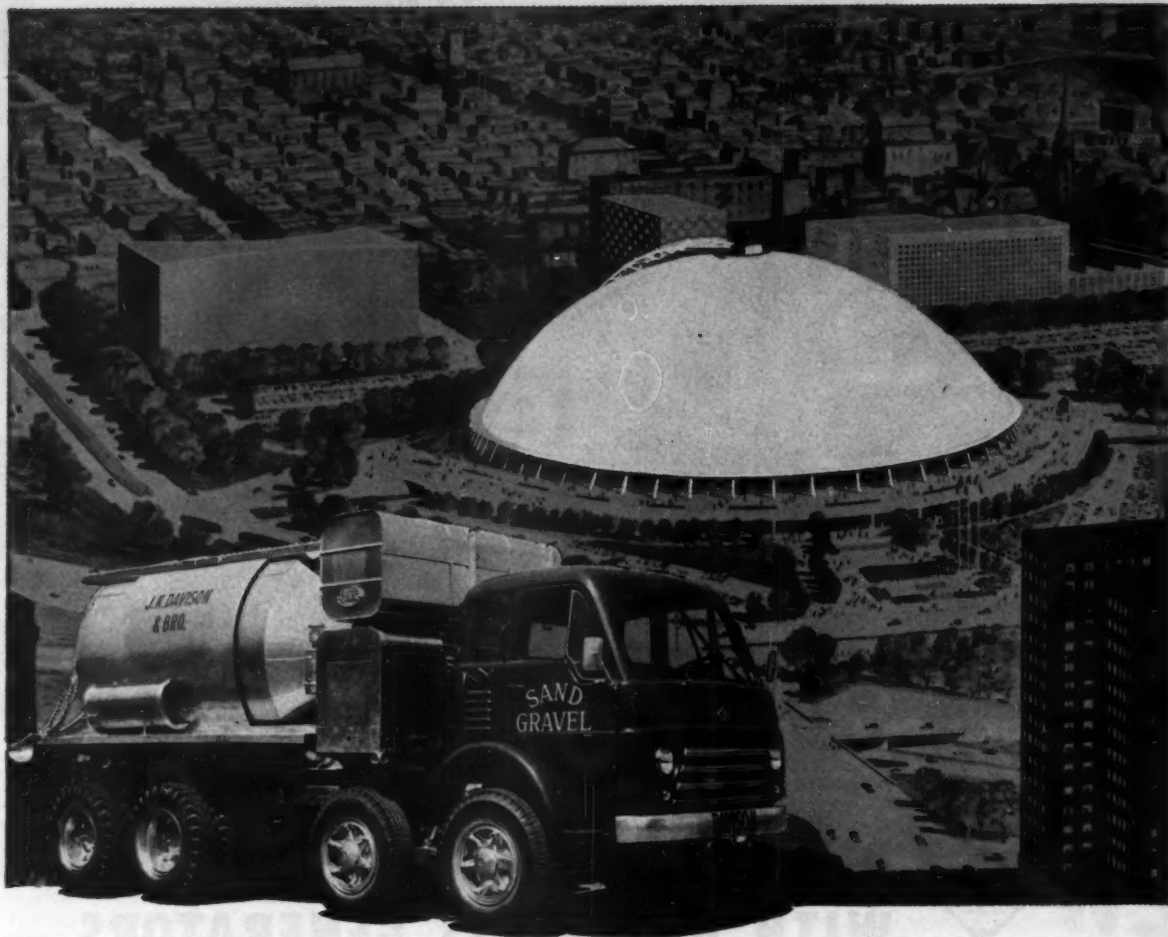
Your Allis-Chalmers dealer can give you complete specs, and assist in determining your needs. Call him or write Allis-Chalmers, Milwaukee 1, Wisconsin.

8G-36

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Davison's rigs move more payload in less time

J. K. Davison & Bro., Pittsburgh, one of the largest ready-mix purveyors in western Pennsylvania, is supplying concrete for the Steel City's gigantic new civic-sports arena.

To increase the capacity of their ready-mix fleet, Davison recently purchased two high-payload Diamond T trucks with 8-yard mixers, 212 hp engines, Fuller Model 5-A-65 5-speed Transmissions and Eaton-Hendrick-

son Model 38DS Tandem Rear Axles.

Selected because of their proven reliability and ease of operation, the Fuller 5-A-65 Transmissions help provide the proper gear ratios for high maneuverability on congested job sites as well as added flexibility in city traffic.

Davison's new trucks feature four-axle construction, permitting GVW of 60,000 pounds. Because chassis

weight has been held to 16,000 pounds, high payloads are possible . . . and because the Fuller 5-A-65 Transmissions permit the operator to select proper gearing for every situation, Davison is able to hustle more ready-mix to the job in less time.

There is a Fuller Transmission designed to put more profit in *your* operation. For details, contact your truck or equipment dealer.

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ROCK DRILLS . . . continued

on the backhead and chuck end. It is suggested that a wrench with a long handle be used, and the nuts be tightened a fraction of a turn at a time.

Operating Practices

The life of a rock drill can be increased by proper maintenance practices, but improving drilling practices is also an effective way of cutting drilling costs.

Maintaining alignment with the drill rod while drilling not only reduces chuck wear but reduces drill rod breakage. Pulling drill rod at partial, instead of full throttle, reduces the dieseling tendencies that rob the drill of lubrication.

Watching the amount of oil fog coming out of the exhaust port enables the driller to adjust the oiler so that a uniform flow of oil is maintained even when the temperature varies widely during the day. Flushing the drill with oil and plugging the openings at the end of the day do much to discourage corrosion of the internal parts.

Chuck and hammer life may be increased by giving close attention to the condition of the drill rod shanks. Make sure the striking faces are flat, square, and free of chips. The habit of coating the shank with oil before placing it in the drill will pay dividends by increasing the life of the shank and chuck bushing. Drilling at full throttle through broken formations should be discouraged. The use of part throttle here will reduce or eliminate scoring on the hammer and rifle bar.

Like an automobile, the drill will last longer and run with less cost and greater reliability if given an occasional, regular check-up. In the case of the drill, the cost of this preventive maintenance is practically nil since it usually requires only a few minutes to remove the two side rod nuts to permit checking the hammer, rotation mechanism, and chuck parts. Under favorable conditions, the quick check-up can be done out on the job.

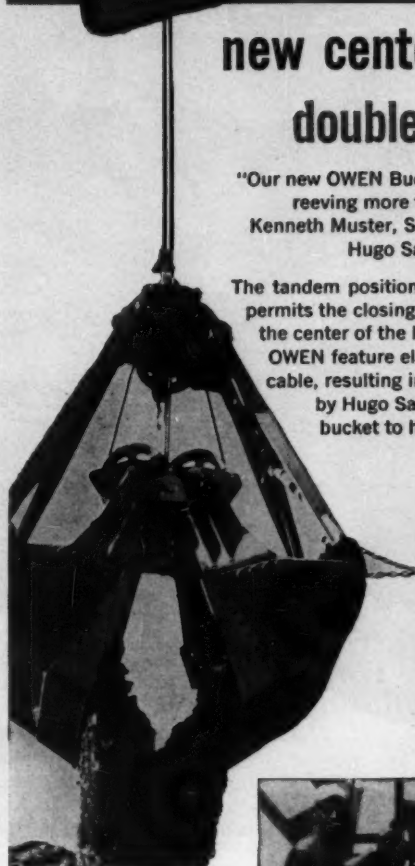
The modern rock drill is designed to perform at high efficiency while drilling for thousands of feet. Intelligent drilling practices and good preventive maintenance will pay off in easier drilling and less downtime.



new center line reeving doubles cable life

"Our new OWEN Bucket is great. That new center line reeving more than doubles our cable life," says Kenneth Muster, Supt. for R. F. Muntz, owner of the Hugo Sand and Gravel Co. of Kent, Ohio.

The tandem positioning of the lower closing sheaves permits the closing line lead to pass directly through the center of the head of the bucket. This exclusive OWEN feature eliminates excessive bending of the cable, resulting in increased cable life experienced by Hugo Sand and Gravel. It also permits the bucket to hang plumb from the crane boom.



"Our operation is tough on a clamshell, but all these improved OWEN features have greatly reduced our maintenance costs and cut down-time," claims Mr. Muster.

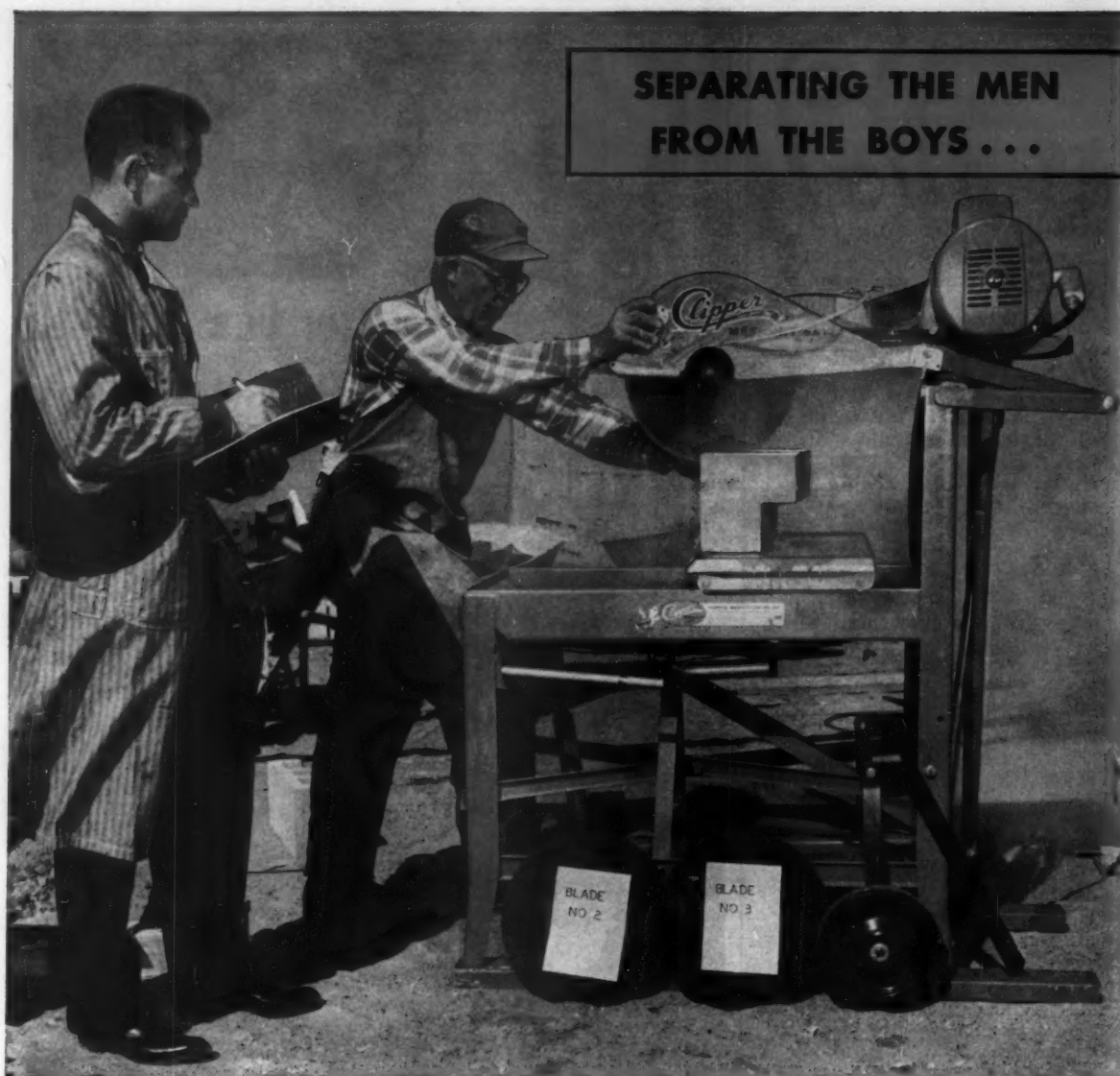
This OWEN Clamshell, with all moving parts lubricated . . . with all arm and sheave pins, plus the main shaft, having triple lip grease seals . . . has heavily cut the high maintenance expense of handling this sand suspended in water that comes directly from the wash plant.

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In most every field a boy is often sent to do a man's job because it costs a little less at first. In every case, experience and stamina are finally needed to get the job done faster — and at lower cost.

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For your "men-from-the-boys" test, call your nearest Clipper Factory Trained Representative. He's on call day or night with just one job: serving your masonry and concrete cutting needs with Premium Quality Diamond, Break-Resistant and Abrasive Blades. He'll conduct an eye-opening "separation" test right on your job, without cost or obligation, and will UNCONDITIONALLY GUARANTEE that man-sized Clipper Blades, will out-cut ... out-perform ... and out-last any other blade.

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How to select the right friction material for the right spot to cut maintenance costs

Over 50% of all premature failures in relined brakes and clutches are caused by the improper selection of friction material for the machine's requirements.

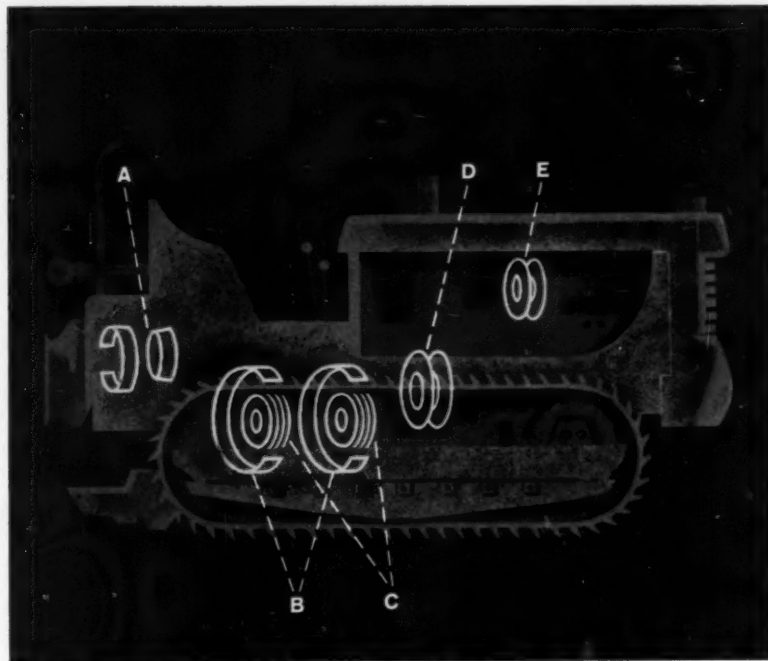
Working closely with machine operators, J-M Friction Engineers have developed a wealth of knowledge and data, which can help you extend the period between overhauls and at the same time step up the power and efficiency of your equipment.

Here is a diagrammatic sketch of latest recommendations on the selection of friction materials for a typical crawler tractor . . . this information is based on the wide, practical experience of countless operators.

Johns-Manville Friction Materials, factory equipment on many machines, offer the most complete range of styles in the field. They can fulfill the friction material needs of any piece of equipment in any service. J-M Moulded Asbestos Frictions, particularly well-suited where heavy shock loads tend to crush or shear materials, give long life in hardest use. For those who prefer woven frictions, J-M Woven Asbestos Roll stock, in a variety of styles, seats quickly, will not score, and has great mechanical strength.



Woven J-M Cone Facing being applied to a power take-off unit.



Easy guide to proper friction selection:

- A. Power Take-Off** receives sudden shock loads, intermittent loading.
 - Cone clutch—Style 510 for easy seating. Style 304 for those operating in oil.
 - Brake Lining—Style 240 for good wear and friction stability.
- B. Steering Brakes** subject to erratic engagement and extreme wear.
 - Style 240 for light-duty tractors . . . Style 140 for heavy-duty tractors for high quality and excellent wear characteristics.
- C. Steering Clutch Discs** exposed to high energy loading with shock, slippage and heat.
 - Style 140 straight clutch facing . . . Style 141 Gear Tooth Facing, for their resistance to shock, heat dissipation, low-fade characteristics

and Style 141's high tooth impact strength.

- D. Master or Engine Clutch** exposed to constant high energy loading.
 - Style 751 for light-duty tractors for good wear and engagement characteristics and Style 140 for heavy-duty tractors.
- E. Starting Engine Clutch** needs positive, non-slip, non-grabbing friction.
 - Style 751 because of excellent cushioning action and engagement characteristics.

The assistance of a friction materials specialist to help you select your requirements is available through your Johns-Manville Distributor. Your own copy of the J-M Industrial Friction Materials book, listing all friction materials' types, styles and recommendations can be had by writing Johns-Manville, Box 14, New York 16, N. Y. In Canada: Port Credit, Ontario. Ask for FM-35A.

JOHNS-MANVILLE





Long Island Expressway contractor cuts maintenance costs using

GULF MAKES THINGS RUN BETTER

"We're working on a \$6.5 million contract, and we keep a sharp eye on relative costs. For instance, we believe that downtime and repairs cost more than good fuels and lubricants. So, we keep downtime and repairs to a minimum by using clean-burning Gulf fuels and clean-working Gulf oils."

That's the word from Mr. William W. Spiess, Fleet Maintenance Superintendent for Gull Contracting Company, New York City. Their multi-million dollar contract involves construction of two miles of the new Long Island Expressway.

In just one location on this job, they're moving over 300,000 cubic yards of dirt, concrete and bituminous

surfacing. Heavy equipment includes a Lorain 2 1/4-yard maintenance shovel, D8 Caterpillar dozers and a fleet of 14-yard Mack diesel trucks.

All their diesel engines are fueled with Gulf Diesel and lubricated with Gulf Super Duty Motor Oil. Equipment records show rock bottom maintenance costs—ample proof that Gulf makes things run better.


"When we open an engine for general overhaul," says Mr. Spiess, "we find it clean, free from harmful carbon and sludge."

To find out why Gulf makes things run better, write for "Gulf and Your Business" . . . and for the revised edition of "Contractors' Guide"—an 88-page manual of

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"We're money and time ahead with clean-burning Gulf Diesel-
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...tendent. "These fuel injectors cost up to \$80 each. We'd
...rather buy clean-burning fuel than replace them too often."



SP-9466



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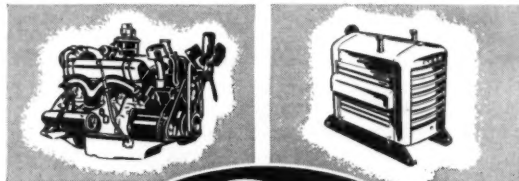
SERVICE MANAGER: "Ford's world-wide service facilities are second to none! Our dealers report customers have less downtime because they get prompt service from Ford Dealers everywhere."

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one of the world's most successful manufacturers, they protect our reputation and customers' investments."

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YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED!

About the Author

John Scott Andrew is a sales engineer in the Pneumatic Division of the Chicago Pneumatic Tool Company. He is a 1947 graduate in mechanical engineering from Penn State.



Good tool maintenance means greatly increased operator efficiency, says this expert.



GET A HAMMER—Air tools are rugged enough to stand a lot of abuse—but not this much. Don't use air tools as hammers.

AIR TOOLS

IN THE HANDS of good operators portable air tools can save time and reduce costs on many jobs. Yet, the best operator is only as good as the demolition tool, impact wrench, clay digger, backfill tamper, or other air tool he is handling.

Too often, the performance of air tools is permitted to fall off drastically because of lack of attention to basic maintenance. Poorly maintained air tools are costly from two points of view. First, expensive labor produces less per hour as the tool's performance deteriorates. Secondly, worn tools consume more air.

Air tools, though precision-engineered, are constructed to withstand a terrific amount of abuse. But a little common sense goes a long way toward keeping performance up, repair bills down. Three "musts" for efficient air tool performance are:

- 1) A clean, dry, and ample air supply.
- 2) Adequate and proper lubrication.
- 3) Periodic inspection and replacement of worn parts.

Air Supply

In both reciprocating and rotary air tools, close clearances be-

tween certain moving parts are essential. Dirt or dust in the air supply cause rapid deterioration of these parts.

Most air tools have wire-mesh strainers in their air inlets to prevent entry of foreign particles. However, if the air is not filtered before it reaches the air inlet of the tool, these screens quickly become clogged, choking the air supply and necessitating frequent cleaning. Wherever possible, porous element-type air filters should be installed in the air lines and cleaned frequently.

Moisture in the air supply adversely affects tool performance in several ways. Excessive moisture interferes with proper lubrication and can result in rusting of internal parts. Ice formation within the tool's air passages creates back pressure that restricts the output. Again, moisture exhausted by the tool can be extremely irritating to the operator. Most air line filters are reasonably effective in removing moisture, but unusually wet air may require the use of a moisture separator in each branch of the air piping.

Portable air tools, with few exceptions, are designed to operate at 90 psi, gaged at the tool inlet

while the machine is operating. This means that the delivery pressure at the compressor must be greater than 90 psi to compensate for the unavoidable pressure drop in the air lines. It also means that all air piping, fittings, and hoses must be of sufficient size to keep this pressure drop to a minimum.

If the air pressure falls below 90 psi at the tool inlet when the tool is operating, it is likely that either the compressor is not capable of delivering the required volume of air or the delivery pressure at the compressor is not high enough to compensate for the pressure drop.

It is also important to bear in mind that other tools may be operating from the same air supply. Therefore all tools working off a particular air supply must be in normal operation if an accurate pressure check is to be made.

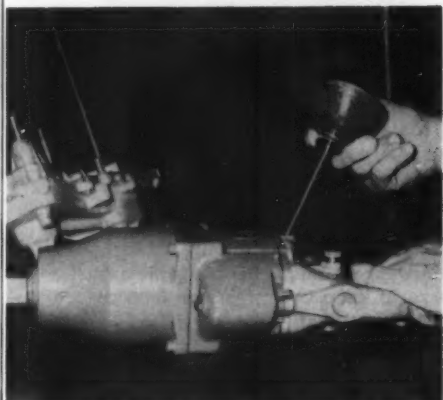
Lubrication

An intelligent automobile owner would not use his car without having it properly lubricated. An intelligent air tool operator should not try to operate his equipment, without a similar lubrication.

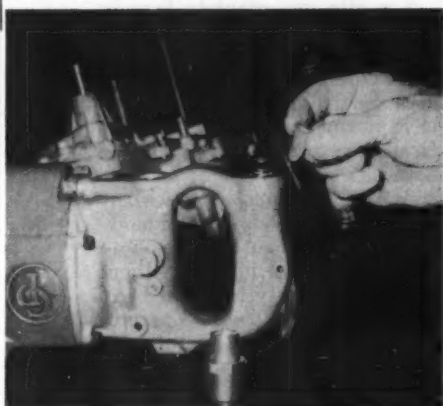
Special oils are available for lubrication of air tools, and manufacturer's recommendations should be followed carefully. These special oils have three im-



PIPE SIZE—Make sure air piping, fittings, and hoses are of the prescribed size to avoid an excessive air pressure drop from the compressor to the inlets of air tools.



LUBRICATION—The oil reservoir of all air tools should be filled daily and checked continually. During the daily lubrication, pour a little oil into the air inlet.



AIR SCREENS—Air screens should be checked frequently and accumulated dirt removed. This is especially important with the closer-tolerance, small air tools.

portant functions in addition to the obvious one of friction reduction between moving parts.

First, oil serves as a sealer between closely fitting parts, limiting air leakage and increasing efficiency. Second, it acts as a coolant, dissipating heat from high-friction surfaces. Third, oil actually absorbs moisture in the air, forming an emulsion. This action does not interfere with the oil's lubricating qualities, and rusting is unlikely even though this emulsified moisture may remain in the tool during long periods of idleness.

Many air tools have built-in oil reservoirs to provide continuous lubrication. These should be filled daily, and a small amount of oil should be poured into the tool's air inlet each morning prior to operation.

It is often difficult to provide adequate supervision to guarantee that these reservoirs are kept filled. A widely used and highly recommended method of assuring proper air tool lubrication is to install lubricators in the air line.

These line oilers are available in various capacities and pipe sizes. Keeping them filled becomes the job of regular maintenance personnel. Where long hose lines are used, line oilers suitable for insertion between two lengths of hose or for attachment to the tool inlet are available.

Naturally, a filter or moisture separator should never be located downstream from a lubricator. Conversely, if a pressure regulator is required in the line, it should be located downstream from the filter or separator and upstream from the lubricator.

Inspection

Despite careful lubrication and scrupulous observation of the air supply, the constant use and abuse to which air tools are subjected mean that a periodic maintenance plan must be scheduled, and worn parts repaired or replaced. It is imperative that this schedule be maintained. The particular tools to be inspected should be taken from production and sent to the maintenance shop on schedule. Otherwise, one worn part might cause irreparable damage.

Once a procedure is established and a schedule maintained, pre-

ventive maintenance is relatively easy. In the hands of skilled tool maintenance personnel, the machines should be completely disassembled and all parts washed. Kerosene will serve as an effective cleaner for most parts. Maintenance personnel should be warned, however, not to wash sealed bearings in a solvent.

Air screens and filters should be cleaned or replaced if damaged. The felt wicks in the oil packets should be cleaned carefully or replaced if hard.

Rotary Equipment

Rotary vane motors must be carefully inspected for wear. Excessively worn or scored end plates and cylinder liners should be replaced. If the blades are worn at the ends so that they are shorter than the rotor, or if the long edges which contact the cylinder liner are worn noticeably, they should be replaced.

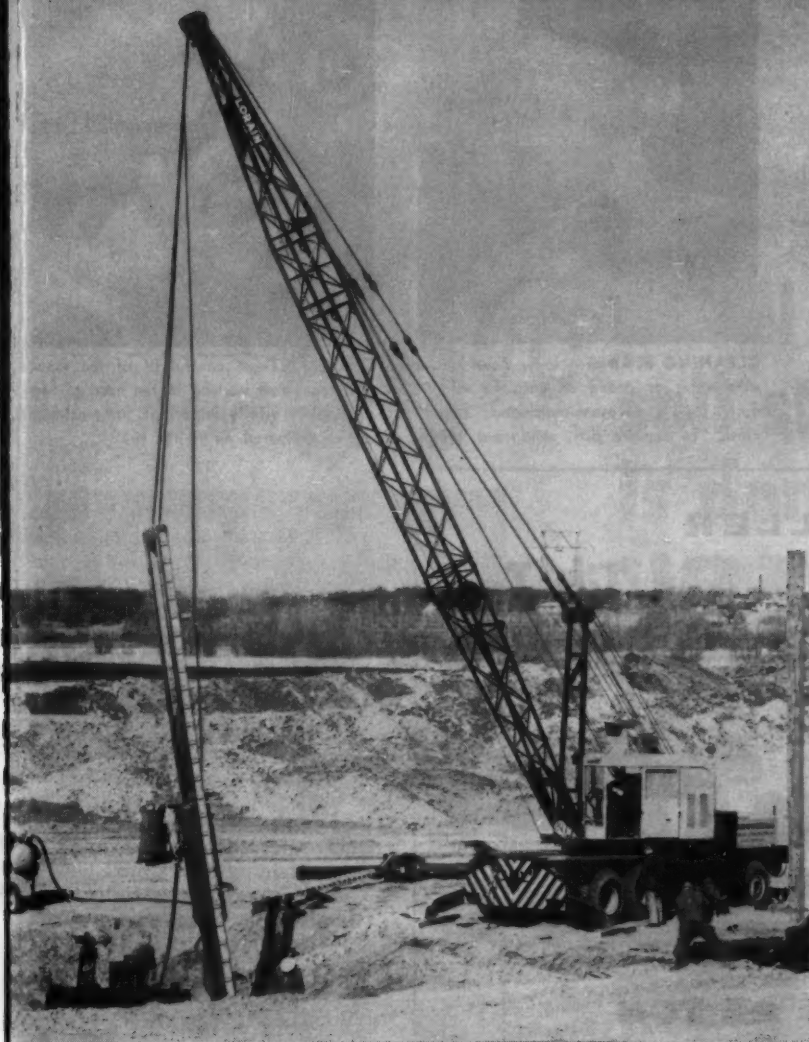
Bearings in the end plates should be examined carefully. The outer race should roll freely while the inner race is being held firmly. If there is any perceptible play, either radially or axially, between the inner and the outer race, the bearing should be replaced.

Clean the interior of the compressor portion if foreign matter is present that would interfere with free movement of the blades within the rotor. To clean, it is necessary to remove and disassemble the compressor portion, but it is not usually necessary to pull the floating head plates and bearing cones from the ends of the rotors.

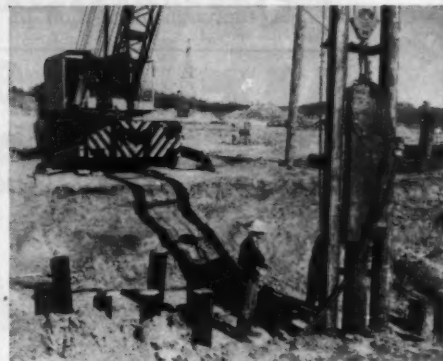
Cleaning may be done by brushing and scraping, using solvents when necessary to soften the deposits. Caution must be used when cleaning blades. They should never be cleaned with water solutions or with any strong solvents but merely cleaned with a soft cloth moistened lightly with kerosene, benzene, or diesel fuel. Deposits can be scraped or sandpapered off.

Percussion tools such as chipping hammers, clay diggers, and backfill tampers should be disassembled and inspected periodically. Tools used outdoors or stored in unheated areas should be inspected more frequently than others.

Scored cylinders or "sloppy"



◀ Arrowhead Engineers and Constructors, Inc. of Duluth, use their 35-ton Lorain MC-530W Moto-Crane to drive 50,000 feet of pilings, pour concrete, and handle forms on a 532-foot bridge job near Little Canada, Minn.



▲ Quick leveling on uneven ground. Each outrigger is independently controlled. Crane can be leveled easily. Eliminates uphill swinging with attendant clutch wear, hazardous side loadings on boom.



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We make more moves with our Moto-Crane on this bridge job—and they are always in a hurry," reports Lytle Brown, General Superintendent of Arrowhead Engineers and Constructors, Inc.

"Our Lorain Power-Set Outriggers save time and money . . . remove all the headaches from setting up for the job.

"Just the other day we moved to a side spot, kicked out our Power-Set Outriggers, made a lift, and were done in 10 minutes. With regular outriggers it would

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Set up in 56 seconds. Four independently controlled, hydraulically powered, curved beams move out and down simultaneously. Then two wedge locks automatically secure beams. Brown sums it up: "We don't need different size blocking, or require a couple of men to pull out the beams."

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THE THEW SHOVEL COMPANY, LORAIN, OHIO

LORAIN®

ON THE MOVE



AIR TOOLS... continued

fitting pistons should be replaced or reconditioned. Most tool manufacturers either offer reconditioning service or they can recommend reputable organizations which will do such work. The valve parts should be carefully examined for wear, and all air passages in the handle, valve case and cylinder should be blown clear.

A thorough inspection of the



CLEANING BLADES—Never clean blades with water or strong solvents. To remove dust, use a kerosene-moistened, smooth cloth. To remove dirt, sandpaper blade.

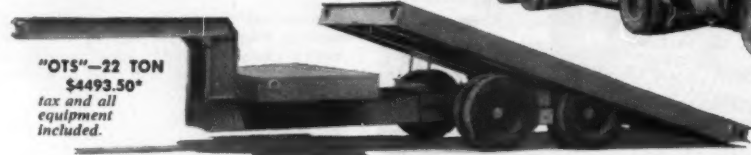


CHISEL FIT—A careful fit of the shank into the chisel bushing in the nose of any air tool is vitally important for maximum use of delivered air to the tool.

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chisel bushing in the nose of the tool is of particular importance. There are two reasons for replacing a worn chisel bushing. First, when the chisel is inserted in the bushing, it closes the lower end of the cylinder. Therefore, the better the fit between the bushing and the chisel shank, the less air leakage there will be out the front of the tool on the return stroke. Second, the striking faces of the piston and the chisel shank must be maintained parallel to each other to minimize wear in the cylinder and maximize power. This is impossible if the fit between the bushing and the shank is loose enough to permit cocking the chisel in the tool.

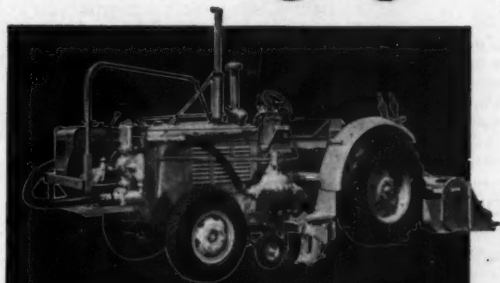
Just as the use of an ineffective air tool can handicap a worker, so can an ineffective accessory handicap the tool. Wrench sockets should be the correct size for the particular nut or bolt and should fit snugly on the wrench shank. Grinding wheels that are out of round should be dressed. Wheels that cannot be balanced should be discarded. Hammer chisel points should be ground to shape frequently, and chisels should be discarded when the shanks are worn.

The importance of following the manufacturer's recommendations on the proper maintenance of each tool cannot be over-emphasized. Do not hesitate to consult a representative of the manufacturer regarding any maintenance points that may not be completely covered in the instruction book that is furnished with the tool.

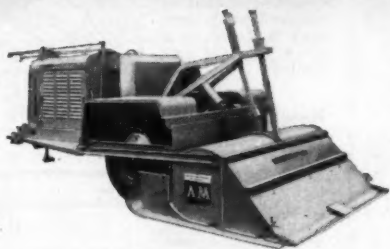
A thoughtfully planned and scrupulously supervised maintenance program will improve the productive output of air tools, sharply reduce downtime, improve safety records, and effect genuine savings in repair costs.

80%

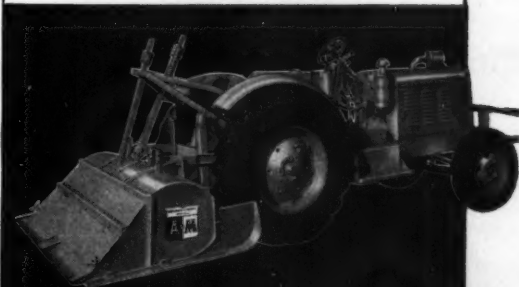
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equipped with pump, tachometer, volumetric
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The **STĀ-BILT** Self-Propelled Mixer

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What's more, the STĀ-BILT MIXER handles any binder and any material — and it leaves the mix shaped to crown and grade, partially pre-compacted ready for final rolling.

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When Sheaves, Sockets
and Clips Misfit...
Your Pocketbook
Will Be Hard Hit



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Here's highest abrasive resistance with super flexibility. Better spooling. Smoother riding on grooves. And Tuffy Dragline Rope hugs the drum when casting for full load. Gives you longer service life, consistent dependability, in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.



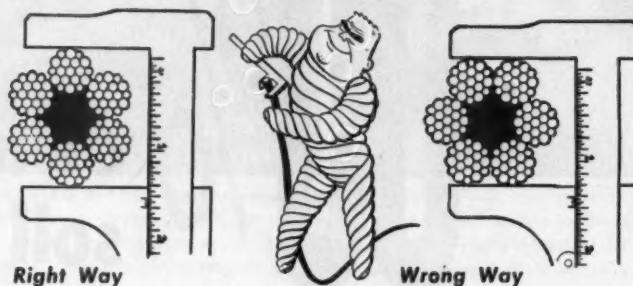
Tuffy Balanced Slings & Hoist Lines

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Tuffy Slings and Hoist Lines are a top-performing team in every type of materials handling. The slings are made of a patented, machine-braided fabric that's next to impossible to knot or kink. The hoist lines are a special construction in which strength, flexibility and toughness are balanced.



How to Measure Rope Diameter



To get the most service, efficiency and safety out of wire rope operation, rope and sheaves must be precisely fitted to each other. There's only one right way to measure rope diameter: use machinist's calipers and be sure to measure the widest diameter.

A slight shift of the rope in the calipers, as shown above, will give you a misreading which would result in ordering an undersize rope. Note that the measurement at right shows $\frac{1}{8}$ " under correct diameter. Be sure to double-check every time!

How to Check Groove Diameter



No Go



Just Go

Groove diameter of a sheave or drum must never be less than the actual caliper diameter of the new rope. When a new rope is installed on old equipment, use a reliable groove gauge to make sure the tread or bearing surface of all sheaves is of sufficient size to avoid pinching the rope.



Kick Out Worn Sheaves

Old sheaves may never die, but in "fading away" they develop conditions which shorten rope life. Sheaves with grooves corrugated with rope lay impressions should be replaced with new ones before new wire rope is installed.



How to Measure Tread Diameter

Easy, and important. Select the smallest sheave or drum to be used with the new wire rope, and measure actual diameter at lateral center (shortest dimension) of tread.



Tuffy Balanced Scraper Rope

"Balanced" construction makes it flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Also gives higher resistance to the shock of load impact on slack line. Moves more yardage per foot because it's specially built to take the beating of drum-crushing abuse.



Tuffy Balanced Dozer Rope

Built to give you longer service with less downtime. Mounted on your dozer, a 150' reel of $\frac{1}{2}$ " or $\frac{9}{16}$ " can give you a big bonus of extra service. Here's how: when rope shows drum wear or is crushed on the drum, you feed through just enough to replace the damaged part. You save the 40 to 50 feet ordinarily thrown away. Also available in 300' and 500' reels.



Use the Right Fittings



Right fittings add life expectancy to wire rope. Fittings which derive holding power from crimping action are harmful.

Shown here is a clamp that has no "wrong side"—can be put on either way. It snugly saddles the rope, grips larger surface area in such a way that loads are carried almost entirely by friction instead of crimping action. Combined in its two parts is a thimble. The parts are interlocked to prevent collapse of the thimble and eliminate all shear on the bolts.

Recommended sizes:

Diameter of Rope	Min. Dia.	Max. Dia.
$\frac{1}{4}$ - $\frac{3}{8}$	$+\frac{1}{64}$ "	$+\frac{1}{32}$ "
$\frac{3}{8}$ - $\frac{1}{2}$	$+\frac{1}{32}$ "	$+\frac{1}{16}$ "
$\frac{5}{8}$ - $1\frac{1}{8}$	$+\frac{3}{64}$ "	$+\frac{1}{8}$ "
$1\frac{1}{4}$ - $1\frac{1}{2}$	$+\frac{1}{16}$ "	$+\frac{1}{8}$ "
$1\frac{3}{4}$ - $2\frac{1}{4}$	$+\frac{1}{8}$ "	$+\frac{1}{4}$ "
2" and larger	$+\frac{1}{8}$ "	$+\frac{1}{4}$ "

New ropes are usually over-size. It is advisable to have groove diameters of sheaves or drums as large as the actual caliper diameter of the new rope, or slightly larger. We recommend sizes as above charted.

9 Steps to Correct Socketing



1. Securely seize and serve with soft wire ties before cutting, and have at least two additional seizings placed at a distance from the end equal to the length of the basket of the socket.
2. When the rope is properly seized, take off the end seizing. Cut the fiber center back to the seizing, as shown in 1 above. Untwist and broom out the wires. See illustration 2.
3. Clean the wires for the distance they are to be inserted in the socket. Use benzine, naphtha, gasoline or other solvent. Then wash off in boiling water or boiling ammonium chloride used in Step 5.
4. Then dip cleaned wires in commercial muriatic acid to a depth not greater than $\frac{3}{4}$ of the cleaned length of wire. Keep the wires immersed for 3 minutes, or until the acid has thoroughly etched each wire. Be sure acid does not contact any other portion of rope.
5. Immerse wires into boiling ammonium chloride. A white coating will be left on the wires.
6. Place a temporary tie wire over the ends of the cleaned wire (see illustration 3). Be careful not to get the cleaned wires greasy or oily.
7. Insert the rope end into bottom of socket. Remove temporary tie wire.
8. Holding the rope vertically in a vise, set the socket so that the wires are flush with top of the socket basket and seal the bottom with putty or clay (See illustration 4). Pour in among the wires about $\frac{1}{2}$ teaspoon of sal ammoniac crystals.
9. Pour molten zinc into the basket until it is full (see illustration 5). When zinc is solidified, the seal is removed and socketing complete as shown in illustration 6. The zinc must not be too hot or it will anneal the wires, particularly of small ropes. Temperature must not be above 925° F. Use pine stick test: if stick chars but does not ignite, the zinc is ready to pour. Overheated zinc will have a red color and stick will catch fire. When zinc has solidified sufficiently, the socket may be plunged into cold water.



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Southern Pacific, one of the largest rock, gravel and concrete suppliers in Southern California, credits the big Trojan with a real streamlining of their plant operation. With a 9' wide bucket, the 404 handles over 4½ yds. per pass — loads a 25 ton truck in 1½ minutes ... and the high travel speed puts this production to work at areas over a mile distant in a matter of minutes ...

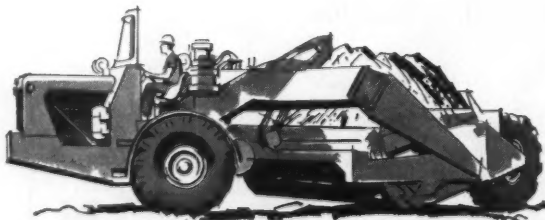
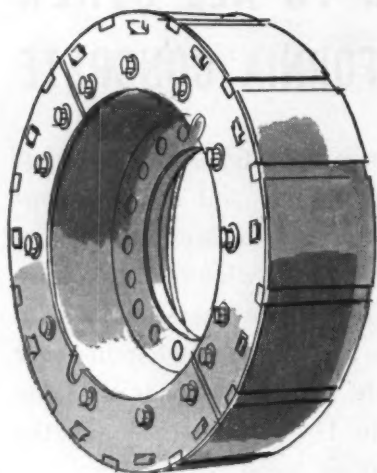
"When you load a 14 ton truck in less than a minute, you have to be pretty sure of yourself," adds operator, Sam Patton, "and the longer, wider wheel base of the Trojan 404 gives me that assurance. Even with a heaped load, it is the most solid, stable loader I have ever operated. I sure agree with the rest of the men here — this 404 is one tremendous machine."

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Well-trained operators, this expert says, will keep these versatile rigs working at a profit

WHEEL TRACTORS

WHEEL TRACTORS have proved they can handle many construction jobs better and faster than any other type of machine.

To get the most out of a tractor the owner must inaugurate a maintenance program of periodic checks and find some method of insuring that the operator of the tractor understands the basic principles of design and operation of the engine and other parts. Proper operation and servicing of the tractor then follow naturally.

The best sources of operational and maintenance information are the operators manual and the preventive maintenance manual that are supplied with each new tractor. In the event these manuals are lost copies usually can be obtained from the equipment dealer or by writing directly to the manufacturer.

Many of the major oil companies also publish booklets that contain a great deal of information on basic principles of design. Each operator should be required to be thoroughly familiar with the operators manual and preventive maintenance manual for his tractor and have access to some source of information about the design of the various components of the tractor.

When a new tractor is delivered, it is designed and adjusted to give the best possible performance and economy. The elements of a wheel tractor, listed in the simplest possible way, consist of an engine, a clutch, a transmission, and a final drive. The complete tractor usually has a hydraulic power system for operating and controlling accessories and a power take-off shaft for

About the Author



JOHN SUDLOW is Assistant Service Supervisor of International Harvester. He is a University of Illinois graduate.

supplying power to drawn equipment.

Engine

Since the engine is one of the most important parts of a tractor, I will first discuss operational and maintenance procedure on engine components.

The fuel system will provide trouble-free operation if clean fuel is used. To obtain best results use the fuel for which the tractor is designed. Fuel specifications can be found in the operators manual.

Safety is something that tractor operators must practice at all times. They should check the fuel system for leaks from time to time and always shut off the engine before filling the fuel tank. Filling the tank after the day's operation and running the tractor until the fuel system is supplied with fresh fuel is one way to make sure that there will be volatile fuel for cold starting. Filling at

the end of the day also will eliminate condensation problems.

The entry of abrasive dust and dirt in the engine with the intake air is responsible for much premature wear and many operating difficulties. Don't feed dirt to your tractor. Service the air cleaner every 10 hours. Dirt is the biggest enemy of the tractor engine. Running a tractor for 10 hours without an air cleaner under dusty conditions could ruin the engine.

An average engine uses 9,000 gallons of air per gallon of fuel. If the air cleaner is only 50% effective, 37 lb of dirt will enter the engine in an average year's use, causing engine wear, loss of power, and excessive fuel consumption. It's also a good idea to check all connections in the air intake system periodically for loose or broken connections.

Cooling System

Care of the cooling system is more critical than most operators realize. The cooling system should be kept filled to the proper level with water treated with a rust preventive in above freezing temperatures or an anti-freeze solution in freezing temperatures.

Tractors are equipped with a thermostat or a shutter system to control the temperature of coolant in the system. In general the most efficient cooling water temperature for gasoline engines is 165 to 185 deg and for engines operating on heavier type fuels, 190 deg or more. A faulty thermostat should be replaced with a thermostat of the same temperature range as the one being replaced.

continued on next page

The pressure cap should be checked for proper setting. A faulty pressure cap is a common cause of overheating. Each pound of pressure raises the boiling point of water 3 deg, and most pressure caps are set for about 7 lb. So it's easy to see that an inoperative pressure cap will cause undue loss of coolant through evaporation.

The fan belt tension is another point to be checked because fan belt slippage will cause inefficient operation of the fan and water pump.

Lubrication

The lubrication system has five main functions to perform:

1. Reduce wear to the minimum.
2. Minimize friction.
3. Absorb shocks and cushion loads.
4. Seal power between piston rings and cylinder walls.
5. Supplement engine cooling.

The use of the type of lubricating oil recommended in the operators manual will assure that the

the oil will perform these functions.

Maintenance procedures pertaining to the electrical system can be found in the operators manual. A component in the electrical system that often is neglected is the storage battery. Maximum satisfactory service can be obtained from the storage battery by following a few simple precautions. The battery should be checked at least once a month for water level and specific gravity. Only distilled water should be added.

A tractor engine must be able to run free of load for starting, idling, and shifting gears. It is not only necessary for the engine to be running before a load is applied, but it is desirable to have some means of applying the load gradually. The mechanism of the clutch accomplishes this. The clutch requires periodic adjustments, as explained in the operators manual, and proper operation if satisfactory service is to be obtained.

The operator must use the clutch mechanism in a fully engaged position or fully disengaged position as much as possible. Any intermediate position will cause slippage and excessive wear. The clutch should not be used as a substitute for the throttle. When the operator wishes to decrease his forward or backward travel speed, it should be accomplished through the use of the throttle control. Many tractors in use in the construction industry are equipped with loaders or lifts. Operating them often results in short clutch life unless the operator can master an operating technique that will eliminate slipping of the clutch.

Transmission

A characteristic of the internal combustion engine is that at very low speeds it does not develop sufficient torque to pull heavy loads. On this account, a transmission gear set is required to provide the proper engine speeds for the loads involved. A

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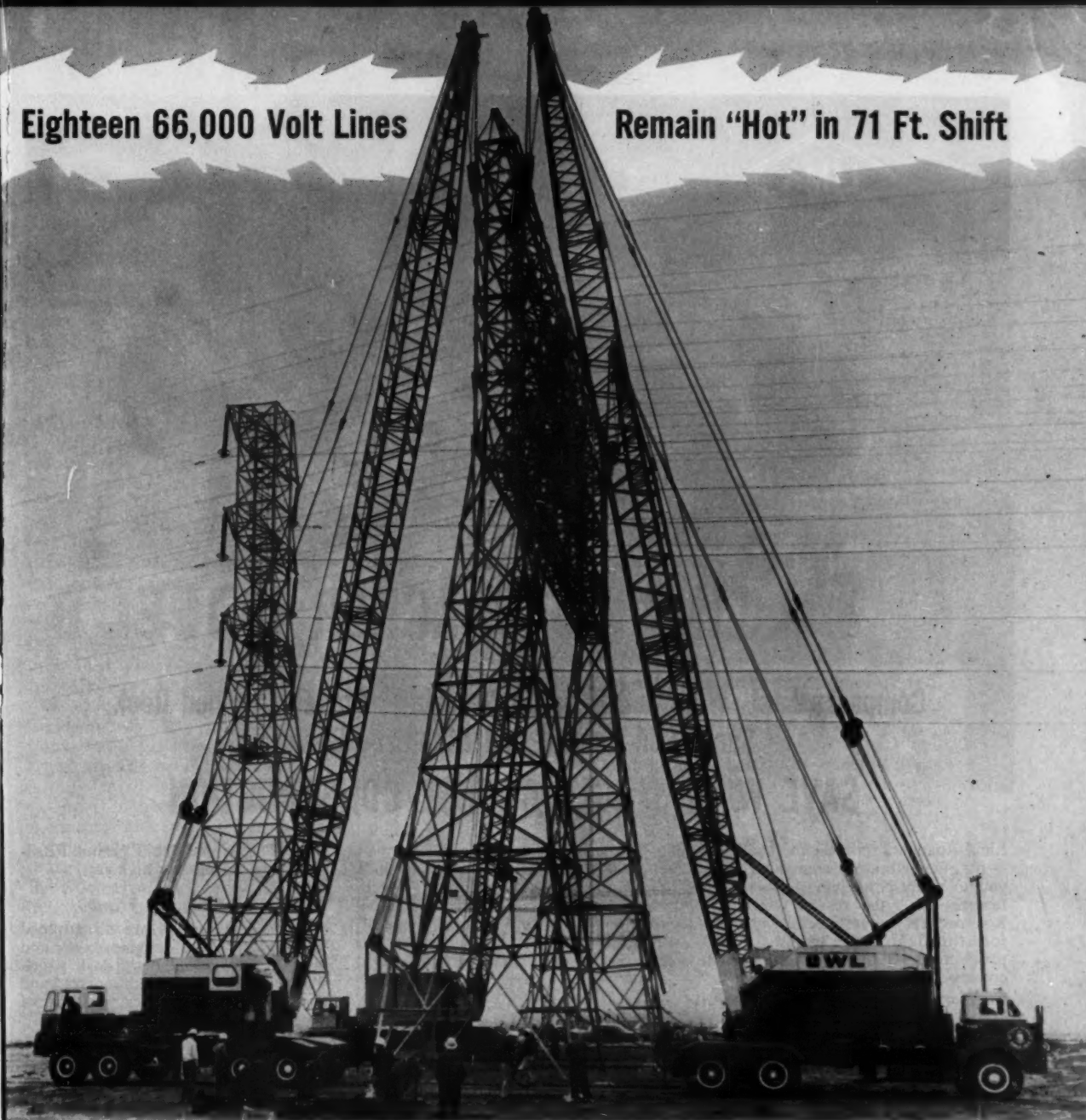
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REPRESENTATIVES

Timberland Machines Inc., 169 Front St., South Portland, Maine. Mason and Bacon Inc., McLure Building, Frankfort, Kentucky. Bailey Bridge Equipment Co., 1767 Conejo Avenue, San Luis Obispo, California.

Eighteen 66,000 Volt Lines

Remain "Hot" in 71 Ft. Shift



Live Wire Planning on High Tension Job ...

AMERICAN CRANES MOVE TOWER IN 3½ MINUTES

To make room for a freeway ramp, this 95-ft. tower was moved 71 ft. without de-energizing its 18 high tension lines, each carrying 66,000 volts. Four American Truck Cranes, with 110 ft. boom length each, and with combined lifting capacities of 210 tons, completed the job in just 3½ minutes for the Owl Truck and Construction Co.

The lines, serving Long Beach and Compton for the Southern California Edison Co., were supported on sheaves at the bottom of the insulators while the move took place. On this critical job, as in all construction work, the proven stability of American Truck and Self-propelled cranes provide the perfection required of any move.

.....
• **SEE FOR YOURSELF:** Learn
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• American construction equip-
• ment can give you. Contact your
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Serving industry for over 75 years

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EXCAVATORS-CRANES
to 2 yds.-60 tons
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to 130 tons
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to 400 tons

**AMERICAN HOIST
PACIFIC COMPANY**
Special materials
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**CROSBY-LAUGHLIN
DIVISION**
Drop forged fittings
for wire rope-chain



NEW LIMA ROADPACKER MODEL D

Compacts Fast, Wide and Deep on Macadam, Gravel, Crushed Rock, Sand, Soil Cement and Stabilized Bases

SAVE WITH SINGLE COURSE CONSTRUCTION

Lima Roadpackers meet the challenge —no other vibratory compactor gives you so many cost-saving job-speeding features . . . the reason why Lima Roadpackers are preferred by contractors throughout the world for fast production on highway and airport construction jobs.

Compare these profit-making features!

Heavy Vibrators

Six 437 pound vibrators deliver earth-shaking vibrations for deep, uniform densities. Vibrator units are completely sealed—no external moving parts. Vibrators are self-lubricated and need no daily maintenance. Required densities are quickly achieved. Macadam rock is tightly keyed, with screenings vibrated into voids in only three applications on most jobs. Compacts up to 600 tons per hour.

Infinite Speeds

20 feet per minute to 30 miles per

hour! A fluid motor propels the machine while compacting. A dial selector gives compaction speeds to match any job including new high production requirements within a broad range of 20 to 95 feet per minute. Roadpacker can be anywhere on the job at a moments notice. Heavy duty transmission provides fast highway travel speeds to next job.

One Lever Instant Reversing

Compacts forward or reverse with one lever control—no gear shifts—no declutching—no stopping. With the Lima Roadpacker you have no lost time and no depression in the material being compacted when machine is reversed.

Variable Working Widths

End shoes fold back for a selection of 4, 5 or 6 shoe working widths. Easily folded by the operator alone, the Roadpacker carries unused shoes ready for wider working widths at any

time. Folded end shoes permit Roadpacker to travel over highway.

Controls Up Front

Roadpacker controls are all grouped at operator's seat—engine gages and controls are mounted on dash panel. Foot accelerator in addition to hand throttle provides natural roading of Roadpacker.

Widener Attachment

Extension arm works shoes in a widening trench to 11" below the existing pavement. Quickly adapted to various width widening work; replaces trench rollers.

These are only a few of the advantages incorporated into the new rugged Lima Roadpacker, Model D. For complete information, see your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio
BALDWIN · LIMA · HAMILTON

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment



WHEEL TRACTORS . . . continued

transmission is also needed for reversing the tractor because the engine itself cannot be reversed.

The tractor transmission is one of the hardest worked components of a tractor, and it is important that all its parts receive at all times a supply of good clean lubricant. Experience indicates that it is advisable to replace gear lubricants at least once a year or every 1,000 hours.

The drive from the transmission to the rear wheels is made through a differential. When the tractor is driven straight forward, both rear wheels naturally revolve at the same speed. When the tractor makes a turn, the inside wheel must turn slower and the outside wheel faster. The compensating gear mechanism that is provided to accommodate this difference is the differential.

In most wheel tractors, the differential gears utilize the same oil that lubricates the transmission. Consequently the recommendations made for the transmission apply equally well to the differential.

One thing to avoid is towing the tractor at a speed greater than normal operating speed. Pulling a tractor at speeds greater than the tractor would travel under its own power causes the gears and bearings to rotate extremely fast. If it is continued for any length of time, it will cause overheating of transmission parts and eventual transmission failure.

Most wheel tractors utilize tapered roller bearings on both the rear and front wheels. These bearings are protected with seals to guard against entry of dust and dirt. In general the rear wheel bearings receive their lubrication from the lubricant carried in the differential of the final drive. The front wheel bearings may be equipped with a grease fitting for gun lubrication; if so, they should be greased daily. Or the front wheel bearings may have no fitting; if so, they should be hand packed. In both cases the bearings should be removed, cleaned, and packed with fiber grease every six months or after every 500 hours of operation.

Brakes

To aid in turning or stopping a tractor, brakes are provided for the rear wheels. Adjustment procedure can be found in the oper-

ators manual. To stop the tractor, depress both pedals at the same time. Before driving the tractor in high gear always latch the pedals together to prevent an accidental pressure on one pedal that would cause the tractor to swerve violently to one side. The danger of the tractor overturning increases four times when the speed is doubled.

Steering the wheel tractor is very much like steering an auto-

mobile. A steering gear, usually of the worm and sector type, is enclosed in a lubricant-tight case. The case and steering linkage should be lubricated and adjusted as specified in the operators manual.

All wheel tractors are equipped with some type of hydraulic power system to operate machines used in conjunction with the tractor—backhoes, loaders, forklifts, blades, etc. The hydraulic power

Another BORTUNCO Success Story:

BorTunCo has an established record with engineers and contractors for capable sub-contract job performance.*

PROJECT:

INTERSTATE HIGHWAY CONSTRUCTION, HOUSTON, TEXAS.



CONTRACTOR:

Russ Mitchell, Inc.

PROBLEM:

How to get 72" underground drainage pipe under street and railroad tracks without interrupting traffic.

SOLUTION:

BorTunCo Tunneling Division tunneled and jacked concrete pipe through caving slickensided clay, using powerful jacks and steel jacking rails designed by BorTunCo engineers.

*Negotiations and inquiries strictly confidential.

THE BORTUNCO GROUP

Road Boring and Tunneling Company, Inc.; Texas
Road Boring Company of La.-Miss.; Boring and
Tunneling Company of America; Texas
Tunneling Company; Horizontal Holes, Inc.



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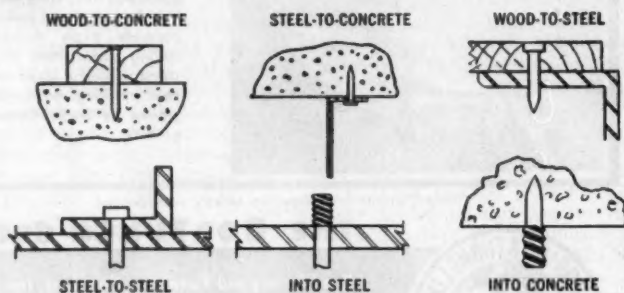
ONLY RAMSET



**"covers all
the bases in
powder-actuated
fastening"**

This statement has been made by hundreds of contractors, architects, electricians, plumbers, maintenance men, supervisors, foremen and others over the past ten years! Whatever the job, if it involves fastening into concrete or steel Ramset can do it more easily, efficiently, and with a lower in-place fastener cost.

Threaded studs, drive pins, eye pins—over 100 specialized fasteners team with ten types of powder charges to assure you of just the right holding power for each job. It will pay you to get more details. Your Ramset dealer is listed in the Yellow Pages under tools...call him today!



In addition to powder-actuated fastening, the versatile Ramset System includes Shure-Set hammer-in tools for light fastening, and Ringblaster® heavy-duty kiln gun.

Ramset Fastening System



WINCHESTER-WESTERN DIV. • OLIN MATHIESON CHEMICAL CORPORATION
12103-G BEREA ROAD • CLEVELAND, OHIO

WHEEL TRACTORS . . . *conti*

system also in many cases actuates a power steering system.

The primary requirement in taking proper care of hydraulic equipment is to keep dirt from entering the hydraulic system. Only a small amount of dirt in the hydraulic fluid can cause considerable damage and operating difficulties.

The operator must follow strictly the manufacturer's recommendations as to type of hydraulic fluid used and filter and oil change procedures. The operating pressure should never be adjusted without the use of a pressure gage, and in no case should the pressure setting exceed the figure set by the manufacturer. Excessively high operating pressure will cause failure in both hydraulic and structural components.

Many tractors are equipped with a power take-off shaft leading from the transmission so that any type of equipment needing power from the tractor can be coupled on the shaft. In most cases the power take-off has its own clutch mechanism. This should be adjusted as recommended in the operators manual. All shields supplied by the manufacturer should be utilized to prevent injury to the operator and bystanders.

Tires

Correct tire inflation is very important both from the standpoint of field performance and tire wear. Tire manufacturers recommendations should be followed as given in the operators manual.

Under inflation will damage the tire cord body and may cause the tire to slip on the rim and tear out the tube valve. Over inflation results in excessive slippage, causing rapid tire wear and undue strain on the transmission components. Check the air pressure once a week with an accurate low pressure gage. Slippage can be reduced by the addition of wheel weights or fluid in the tires.

The operators manual is your guide to trouble-free operation. In the event problems arise that are not covered in the operators manual, contact your dealer—he maintains a complete service library on all equipment and personnel trained to service your tractor.

Twin 1000-barrel Heltzel Cement Plants are partitioned into four compartments to handle up to four types of cement and fly ash. All compartments are loaded by a common elevator.

HELTZEL

twin two-stop
manual plant gives
ready-mix producer
speed, flexibility

By teaming two standard Heltzel batching plants Marion Ready Mix, a leading Pittsburgh concrete supplier, is able to get the high speed production they require during rush periods. Utilizing dual two-stop drive-throughs, four trucks can be handled simultaneously, and different mixes can be batched at the same time by a single batch crew.

Aside from the production advantages Marion is able to handle both plants with a single material handling system. One belt conveyor services all eight compartments of the two 400-ton aggregate plants through an eight-position rotary spout. The four compartments of the two 1000-barrel cement plants are fed by a single elevator through an ingenious system of flop gates. All batchers are controlled from one platform.

The results: Marion charged 30 trucks with aggregate and cement in 35 minutes. A six-yard (19,000 lbs.) aggregate batch was cycled in 45-seconds and a six-yard cement batch in 55-seconds. This from standard manual controls.

If you're not now getting this kind of plant performance why not contact your Heltzel representative for the last word in modern batching technique.

Write today for complete information.

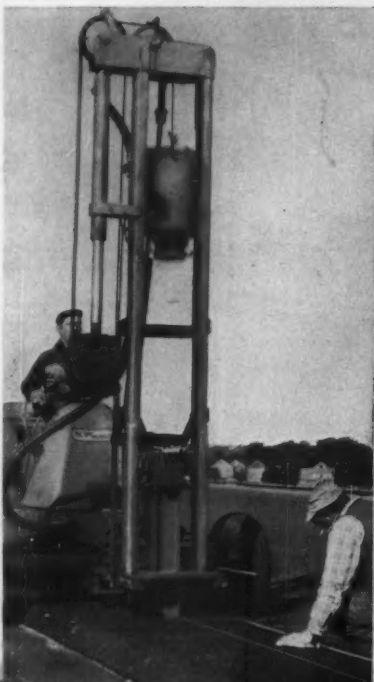
**THE HELTZEL STEEL FORM
AND IRON COMPANY**

WARREN, OHIO





Quickly driven steel posts and easily attached steel beams produce a strong, highly visible and economical guard rail.





Traffic protection at its best

AmBridge Highway Beam Guard Rail and Posts

Rugged, flexible, highly visible steel beam guard rail firmly bolted to sturdy steel posts is the strongest, surest traffic safeguard available. And economical too, since the posts are readily driven and the guard rail is easily spliced and installed.

Both of these AmBridge highway products are available quickly. Besides possessing all of the features of the modern Universal Guard Rail Section, USS AmBridge Highway Beam Guard Rail offers these extra advantages:


1. All mill scale is removed before the guard rail section is formed, assuring uniform, tenacious paint adherence.
2. Prior to painting, all sections are degreased, given two hot water rinses, and oven dried. Then a coat of rust-inhibiting shop primer is applied.
3. USS AmBridge Beam Guard Rail can be furnished in 25' lengths, cutting splicing requirements in half and appreciably reducing bolt costs.

For more information, get in touch with any of the offices listed below.

USS is a registered trademark

New Movie Available—

"Challenge at Carquinez—Project 56-14," an interesting sound and color 16mm film. Showing time, 25 minutes. For free booking, write to Pittsburgh, Pa.



American Bridge Division of United States Steel

General Offices: 525 William Penn Place, Pittsburgh, Pa.
Contracting Offices in: Ambridge, Atlanta, Baltimore, Birmingham, Boston, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Elmira, Gary, Harrisburg, Pa., Houston, Los Angeles, Memphis, Minneapolis, New York, Orange, Texas, Philadelphia, Pittsburgh, Portland, Ore., Roanoke, St. Louis, San Francisco, Trenton, United States Steel Export Company, New York



Austin-Western hydraulic crane gently lowers a 3-ton block of concrete into place on flat bed truck.

Austin-Western hydraulic crane does anything . . . goes anywhere on \$6,500,000 highway project

"It's fast, mobile and versatile. We use the Austin-Western hydraulic crane to do just about everything on the job," reports Norman J. Maggione, general superintendent and vice president of the Bero Construction Co., Waterloo, N.Y.

Two places at once

Bero's \$6,500,000 project, a part of the Niagara section of the New York Thruway calls for six bridges in 1 1/4 miles. Mr. Maggione says, "We have one A-W crane on the job and wish we had more. Our job is split in sections by railroad yards and city streets. Because of their speed and mobility, the self-propelled, rubber-mounted A-Ws can just about be in two places at once."

"Using the A-W crane has doubled our speed in setting bridge panels. It maneuvers easily among tubular pilings

and can turn on a dime. It has plenty of traction and power on any type surface.

Economical to operate, maintain

"We've got lots of economy right along with outstanding job performance. One man on an A-W can often do the work of four. We haven't had any maintenance problems."

"The A-Ws are radio-dispatched. People are always calling for one to get them out of a spot or to speed things up. It's the most versatile piece of equipment on the job!"

Learn more about this Model 210 hydraulic controlled precision crane with 18-ft. telescoping boom and 360° swing, all-wheel drive and steering. Contact your nearby Austin-Western distributor or write us today.

Austin Western
100th YEAR
Baldwin · Lima · Hamilton
Power graders • Motor sweepers • Road rollers • Hydraulic cranes



Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

Distributor Appointments

Marion Power Shovel Co.: The following six distributors have been appointed: Fletcher Equipment & Supplies, Inc., of New Orleans and Baton Rouge, La.; Southern Machinery & Supply Co. of Roanoke, Va.; Cole-Kelly Equipment Co. of Richmond, Va.; Contractors Service & Rentals, Inc., of Charlotte, N. C.; Heiner Equipment & Supply Co. of Salt Lake City, Utah; and Krauser Equipment Co., Inc., of Arlington, Va.

McKiernan-Terry Corp.: The following four distributors have been appointed: Casey & Emmert, Inc., of Chicago, Ill.; Krider Equipment Co. of Fargo, N. D.; Mississippi Valley Equipment Co. of St. Louis, Mo.; and George M. Philpott Co., Oregon Ltd., of Portland, Ore.

Clark Equipment Co.: The following five distributors have been appointed to sell and service the "Michigan" line of construction equipment: Smith Booth Usher Co. of Los Angeles, Calif.; Road Equipment Co. of New Orleans, La.; The Bode-Finn Co. of Cincinnati, Ohio; The Gibson-Stewart Co. of Cleveland, Ohio; and Wisconsin Industrial Truck Co., Inc., of Milwaukee, Wis.

Koehring Co.: The Koehring Division has appointed Equipment and Supplies, Inc., of Pittsburgh, Pa., as a distributor of Koehring trademark products. The Kwik-Mix Division has appointed Al Johnson Equipment Co. of Spenard, Alaska, as distributor of its line of products. The Parsons Division has appointed Equipment and Supplies, Inc., of Pittsburgh as a Trenchliner distributor.

Aeroquip Corp.: The following eight distributors have been appointed: Shako, Inc., of Latham, N. Y.; Carter Engine & Equipment Co. of Abilene, Tex.; Southern

Equipment Co. of El Dorado, Ark.; Industrial Equipment Corp. of Springfield, Mo.; Dick Adams, Inc., of Aiken, S. C.; Uebler's, of Vernon, N. Y.; Sterling Supply Corp. of Philadelphia, Pa.; Derkin & Wise, Inc. of Toledo, Ohio.

On the Sales Front

General Motors Corp.: Euclid Division has announced three changes in its sales organization. D. B. Currence, formerly regional manager in the Southern territory, has taken over the same position in the Eastern region with headquarters in New York City. He is succeeded in Atlanta by D. E. Lutz who has been a Euclid district representative at Memphis for the past four years and is now Southern regional manager. J. W. Carter becomes district representative for the Alabama, Georgia, and Florida territory.

Barber-Greene Co.: The Construction Equipment Division has appointed the following five sales section managers within the structure of the company's headquarters sales organization: John L. Root, manager of the ditcher section; Robert "Scotty" McClure, manager of the portable conveyor and loader section; G. Richard Lundberg, manager of the spreading equipment section; Richard F. Jouannet, manager of the mixing plant section; and J. S. Drew, manager of the sales and technical service training section.

Sprague & Henwood, Inc.: H. J. Longmore has been elected vice president in charge of sales. He is also executive vice president of Sprague & Henwood International Corp., vice president of Mine & Mill Supply Co., and secretary of Rotary Drilling Equipment, Inc., all subsidiaries of the parent company.

Curtiss-Wright Corp.: Edward C. Warsaw has been named district sales manager for Curtiss-Wright's complete line of construction machinery for the territory that includes Minnesota, Iowa, Wisconsin, Illinois, Indiana, and eastern Missouri. He will make his headquarters in Fort Wayne, Ind.

In the Main Office

Blaw-Knox Co.: George E. Kopetz, vice president of production, has been named vice president and general manager of the newly formed Fabricating, Engineering



Austin-Western 5 to 8-ton tandem roller finishes under layment for Buffalo, N. Y., overpass on New York Thruway project.

No downtime—'50 maintenance for 3 years' rugged service from Austin-Western roller

—reports Bruner Asphalt & Construction, Inc., Buffalo, N. Y.

"We've put less than \$50 into maintenance for our 3-year-old 5 to 8-ton Austin-Western tandem roller," says General Manager George Sheperd, Bruner Asphalt & Construction, Inc., Buffalo, N. Y.

"It can be relied upon for precision compaction on every job," he tells us.

Saves trailer rental costs

"The A-W roller travels under its own power. It has enough road speed to move from job to job . . . saving us minimum trailer rental costs of at least \$40. It gets there just as fast as by trailer when you figure the time we would spend waiting for service then loading and unloading.

"It gears down nicely on the job to

smooth and steady low speeds that help assure precision compaction. It's a dependable piece of equipment, too. We haven't had any downtime. The service and cooperation we receive from our local A-W distributor are excellent."

Full line of rollers

The Austin-Western variable weight rollers are designed for finest quality compaction. They are available in 5-8, 8-12 and 10-14 tons tandem—8-11, 10-12 and 12-14 tons with 3 wheels. Also offered is a versatile 3½ to 6-ton portable tandem roller.

For full information about this popular line of rugged variable weight rollers, contact your nearby Austin-Western dealer or write us today.

Austin Western

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes



How to handle WET JOBS

#48 of a series

Project:
Power Plant,
Yankeetown,
Ind.

Contractor:
Traylor
Brothers

Owner:
Aluminum
Company
of America



32 MILLION GALS PER DAY: Griffin's extra-capacity "Aquahog" wellpoints handle extra-heavy ground water flow in coarse-layered soil at river's edge. Multi-stage system is shown controlling 27 ft of water in deep open-cut excavation.

GRIFFIN WELLPOINT CORP.



SALES • RENTAL • CONTRACT

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In Canada: Construction Equipment Co., Ltd. • In Venezuela: Drew Bear & Sons C. A.

A single clamp
locks together
EFCO Steel Forms

Save time, labor and money through faster assembly of EFCO Steel Forms for concrete construction. A simple twist of a plate clamp aligns and locks EFCO Forms together. Then with a brace adjustment clamp, one man alone can brace and align even a high wall form set-up.

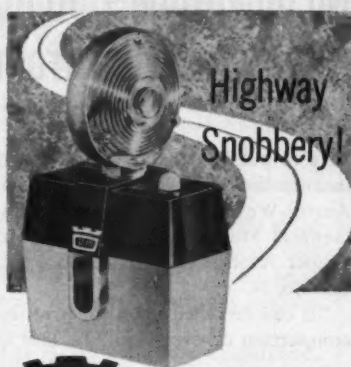
SEND FOR EFCO CATALOG



Economy Forms Corp.
Box 128-N, H. P. Station
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Please send catalog on EFCO Steel Forms, and address of nearest sales office (there are 27 coast-to-coast).

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Firm name _____
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City _____ State _____



pm FLASHER LIGHTS
with Plug-in Transistor Circuit
So good it's Guaranteed Forever!

Users of PM Transistor Neon or Incandescent Flasher Lights say: "They give better visibility...require less maintenance...and have four times greater bulb life, two times greater battery life, and 12 times greater lens life than other flashers—an extra job profit of \$3 per light per month for you." **Adjustable flash rate, too!**

Write for free demonstration. There's a PM Field Engineer near you.

Pacific Mercury

14052 Burbank Blvd.
Van Nuys, Calif.

Manufacturers of the Thomas Electronic Organ



SALES AND SERVICE... continued

and Construction Group. Arthur E. Murton, formerly roll sales vice president, has been appointed vice president and general manager of the new Foundry & Mill Machinery Group. H. G. Coffey heads the company's third operating group as vice president and general manager of Aetna-Standard.

Armco Dainage & Metal Products of Canada, Ltd.: Edward L. Campbell has been elected president of the company. He succeeds S. R. Ives, who is retiring.

D-A Lubricant Co., Inc.: James H. Coover has been appointed to the newly-created position of executive vice president. He joined the company in 1943 as chief chemist and held the position of vice president, production and research, prior to his latest promotion.

Associations

American Concrete Institute: Kenneth D. Cummins has been named technical director of the Institute. He was formerly associate professor of civil engineering at the University of Detroit and has had considerable experience in many phases of consulting work.

National Clay Pipe Manufacturers, Inc.: The following officers for the year 1960 were elected at a recent annual meeting: G. A. Robinson, president; A. J. Reed, vice president and director of research; D. M. Strickland, vice president and consultant to the Board of Directors; A. G. Cochran, secretary; and R. G. Scott, treasurer.

Special Mention

Cummins Engine Co.: Cummins has authorized Interstate Training Service of Portland, Ore., to provide two new home study training courses for Cummins diesel mechanics and employees, and for non-employees as well. Course 101 is entitled "Principles, Maintenance and Repair of Cummins Diesel Engines". Course 201 is called "Cummins Engine Unit Rebuilding". A qualified graduate who completes both courses is eligible for one week's tuition-free training at the Factory Training Center in Columbus, Ind. For further information contact Interstate Training Service, Portland 12, Ore.



where big loads pay off!

Firestone **Perma-Tite** Rims

New Firestone Earthmover Rims are 100% stress-tested and fusion-welded for longest, strongest service!



Here's a rim that delivers full tire support, reduces sidewall flexing and lets tires run cooler for longer wear! That's because Firestone Steel Products Company builds extra strength and dependability into every Firestone Perma-Tite rim! The exclusive Perma-Tite design assures a permanent air seal for maximum tire protection. Fusion-welding gives equal penetration throughout the section for maximum rim service. Firestone Perma-Tite rims are the truest rolling you can own! Specify them as original equipment. Buy them as replacements. They're available for tubeless or tube-type off-the-highway tires.

SPECIALLY DEVELOPED stress tests result in rim reinforcement at high strain points, removal of dead weight.

INTERCHANGEABLE in complete units or by components with all Earthmover rims and parts.

COMPLETE AIR SEAL insures retention of air at recommended pressures, delivers longer tire service.

FIRESTONE STEEL PRODUCTS CO. Akron 1, Ohio

INTEGRITY, ACCURACY, QUALITY, DEPENDABILITY



Now SKF has improved the spherical roller bearing it invented!

This new spherical roller bearing offers even higher capacity than SKF's original, self-aligning bearing — and meets the needs of today's faster, more productive machinery. In some cases, the increase in capacity is as much as 54% — corresponding to more than 4 times longer service life!

Here's how these improvements have been obtained:

1. Eliminating undercuts and integral flanges — helps provide space for larger rollers and longer effective contact between rollers and races.

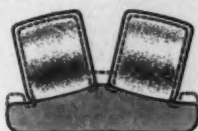


Fig. 1



Fig. 2

2. Using symmetrical rollers, unrestricted by flanges — ensures uniform load distribution over the roller length at all times, even under heavy thrust load.

3. Using an axially floating guide ring — provides effective roller guiding, and minimizes friction at roller ends.



Fig. 3

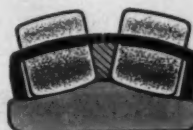


Fig. 4

4. Using a strong "window-type" cage for each row of rollers — helps ensure dependable operation over a full range of loads and speeds.

5. Placing a lubricant duct in the center of the outer ring — helps channel lubricants directly to the rollers and push contaminants away.



Fig. 5

For full details on this new high-capacity spherical roller bearing call the nearest SKF sales office or authorized SKF distributor listed in the yellow pages of the telephone book.

5931



Spherical, Cylindrical, Ball, and Tapered Roller Bearings

EVERY TYPE—EVERY USE

SKF

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

*REG. U. S. PAT. OFF.

Construction Equipment News...



Side Tipping Bucket Dumps Load Three Ways

A front end loader with the Libu side tipping bucket can dump its load to the right, to the left, or forward. The open sided bucket swivels about a central pivot. A hydraulic system controls the dumping operations. The bucket is available in three sizes and is specially designed to fit Caterpillar Traxcavators.

The Libu 2100 bucket fits the Caterpillar Traxcavator No. 933 with hydraulic equipment for front end attachments. The bucket weighs 2,200 lb and is available with a straight or plough-formed cutting edge. Bucket height in dumped position is 65 in.

The model 2350 bucket is designed for Traxcavator No. 955. It weighs 3,520 lb. The dumping height is 80½ in. The 2650 is the largest bucket in the series and fits the Traxcavator No. 977. Without tiltarms it weighs 4,400 lb. Its dumping height is 92½ in. Counterweights are recommended with all three buckets. All parts are interchangeable with Caterpillar standard attachments.

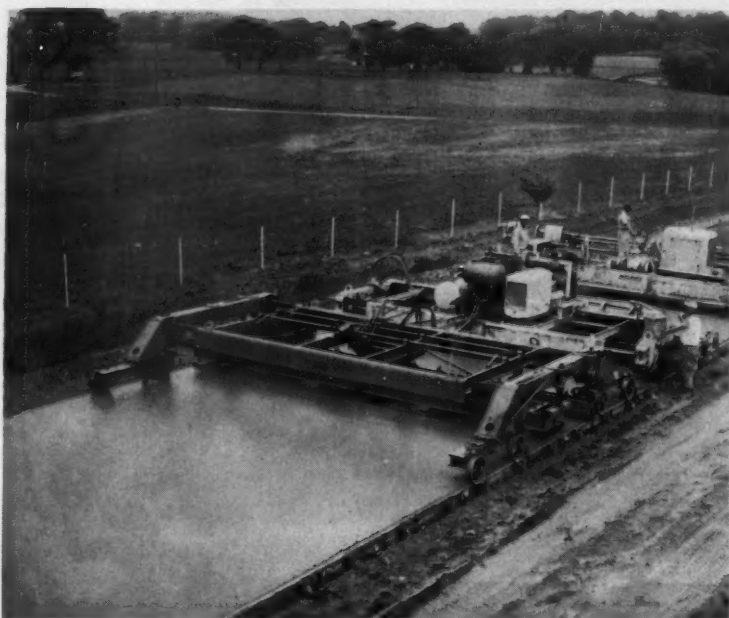
—Libu Shovel Co. AB, Stocksund, Stockholm, Sweden.

Finisher-Float Requires No Operator

Any concrete finishing machine can tow the Jaeger JF Transverse Finisher-Float. No separate operator is needed because all controls—engine, hydraulic pump, and oil tank are located on the finishing machine.

An aircooled Wisconsin TH engine powers the finisher. The unit consists of an oscillating screed and a transverse float. The standard screed has a 6-in. bottom; the float pan has a 30-in. bottom.

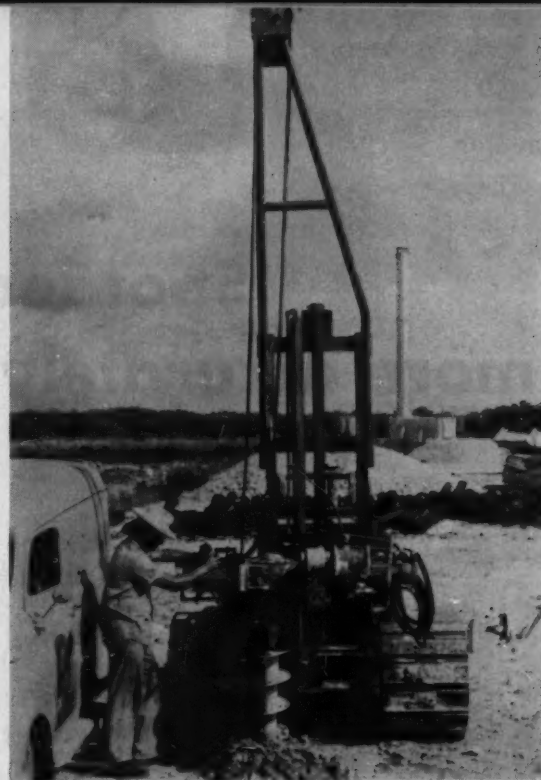
Width is adjustable from 20 to 26 ft by a telescopic tubular frame. A 20-ft metering screed and float pan are standard. Screed and float extensions of 12, 24, 30, and 36 in. are available.—The Jaeger Machine Co., 800 Dublin Ave., Columbus 16, Ohio.



Tractor-Mounted Rig Augers Earth, Drills Rock

Working as a diamond drill this rig can drill in hard rock to a depth of 250 ft. Drilling speed ranges from 50 to 600 rpm. In semi-consolidated material it can auger down to 75 ft with a 4½-in. diameter auger. The rig also bores post holes up to 24 in. in diameter and 5 ft 8 in. deep in one stroke.

The Explorer B-40 drilling rig is manufactured by Mobile Drilling, Inc., of Indianapolis, Ind. It is available for International Harvester TD-6 and TD-9 crawler tractors. The 1,466-lb drill is completely self-contained and can drill at any angle from vertical to horizontal.—International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.



Hydraulic Drive Belt Conveyor Elevates Concrete, Bulk Material

This conveyor can raise concrete to a height of 22 ft at a rate of 40 cu yd per hour. The unit's hydraulic drive prevents roll back if a loaded belt is stopped for any reason. The hydraulic system is completely self-lubricating.

Other features include a self-cleaning tail pulley and a belt that can run in either direction. The top drive pulley keeps the belt slack on the return side. Sealed ball bearings are standard on all rollers.—Morgen Manufacturing Co., Yankton, S.D.



Paver Feeder Picks Up Windrows of Any Height

Full caster wheels with solid rubber tires on this asphalt paver feeder adjust vertically to accommodate any windrow height. Head and tail shaft centers are also adjustable. The wide charging end guides windrows into the feeder.

A gasoline engine powers the feeder. It is equipped with an electric starter and controlled by the paver operator.

The asphalt feeder unit is mounted on the paver by lugs that are part of the feeder. The lugs are pivoted into position and welded to the paver.

The Clark 4590 asphalt paver feeder has a capacity of 250 tons per hour. Capacity of the model 6009 is 400 tons per hour.—Koehring California Co., 2200 Country Club Blvd., Stockton 4, Calif.

Spot loads easier, more accurately with **GAR WOOD**

Gar Wood's 20- and 25-ton truck cranes, the most modern on the market, are engineered throughout for fast, precision control. You can spot a load with amazing speed and accuracy!

Gar Wood's direct gear drive delivers a smooth flow of power, without troublesome backlash. The operator puts this power to work: *easily*—because drum clutches are power-actuated... *accurately*—because direct manual controls retain operator "feel"... *safely*—because worm-driven boom hoist provides two speeds up and two speeds down.

In addition, Gar Wood truck cranes offer full range visibility... give the operator a "control tower" view for maximum safety and accuracy.

Gar Wood, the high-performance truck crane, can do more kinds of jobs... faster... at lower cost. Have your nearby Gar Wood dealer prove it to you soon... with more information and an on-the-job demonstration.

ADVANCED FEATURES ARE "STANDARD EQUIPMENT"



GAR WOOD-BUCKEYE DITCHERS give you modern "extras" that pay off in increased production, ease of operation and low maintenance costs. Wheel-type ditchers feature hydraulic conveyor drive with three speeds in either direction, simplified group controls, "ditcher designed" transmission and hydraulic digging wheel hoist as standard equipment at no extra cost.



GAR WOOD-ST. PAUL builds the most advanced and complete line of arm-type underbody and front-mounted telescopic hoists, with matching bodies for every job requirement. Sold and serviced by the world's largest truck equipment distributor organization.

TRUCK CRANES

GarWood
INDUSTRIES, INC.

Findlay, Ohio • Wayne, Michigan

WITH GAR WOOD

GAR WOOD TRACTOR EQUIPMENT is engineered exclusively for the extra "work-ability" of the world's most powerful tractor—the Euclid TC-12. Gar Wood equipment includes front- and rear-mounted cable control units, Tipdozers, Dozecastors and Rippers.

YOU CAN COUNT ON *Super-Service* From **"SUPER TRIPLE-S"**

**HANDLES HEAVIEST LOADS *Longer!*
AGGREGATES • CRUSHED STONE • ROCK**



"SUPER TRIPLE-S" CONVEYOR BELTING

Designed for conveying bulk materials under most severe operating conditions. Especially suited for long center hauls where tension is high and extreme flexibility required. Built for uninterrupted service—utmost freedom from costly shut-downs for repairs.

Tensile strength, friction and other details determined by specific requirements.

"If it's GOODALL, it MUST be Good!"

Contact Our Nearest Branch or Send for Belting Catalog

Standard of Quality—Since 1870



HOSE • BELTING • FOOTWEAR • CLOTHING
AND OTHER INDUSTRIAL RUBBER PRODUCTS

GOODALL Rubber Company

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.
BRANCHES AND DISTRIBUTORS THROUGHOUT THE UNITED STATES.
IN CANADA: GOODALL RUBBER CO. OF CANADA LTD., TORONTO.

EQUIPMENT NEWS . . . continued

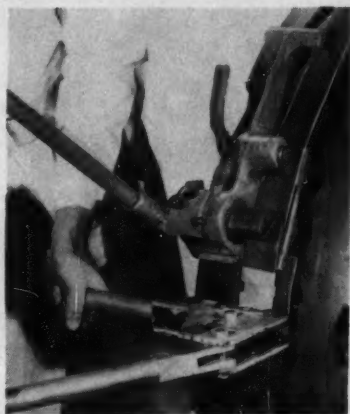


Locking Device For Dump Trailer Bodies

This device locks dump trailer bodies to the chassis and reduces vibration and wear. The Lock-O-Matic is suitable for installation on all makes and models of dump trailers.

When the hydraulic system is engaged to start the lift operation, a valve activates a clearing control on the mechanism, and the clamps are released from the trailer body. Actual lifting force cannot be applied until the clamps are cleared. When the body is returned to road position, the clamps are automatically engaged and locked in position giving a vibration-free connection between trailer body and chassis.

—Trailco Manufacturing and Sales Co., Hummels Wharf, Pa.



New Strapping Method For Handling Large Tires

A new strapping method simplifies shipping, storing, and mounting of large, tubeless, off-the-road tires. The method was developed by Firestone Tire and Rubber Co. in cooperation with Brainard Steel Division of Sharon Steel Corp. Firestone now uses this method at the factory.

The manufacturer places a steel strap around the circumference

"I tried it myself...and the OC-126 changed my buying habits"

E. BOSIO, BOSIO CONSTRUCTION CO., MERRILL, WISCONSIN

OLIVER



"I'LL OUTWORK ANY OTHER MACHINE WITH THIS OLIVER"

Ed Bosio, general contractor, is another who looked beyond the so-called "old stand-bys" and came up with something really new and better: the Oliver OC-126 loader. He asked his Oliver distributor, Brooks Industrial Sales Inc., of Sun Prairie, Wisconsin, to demonstrate...and now can say:

"I use the OC-126 for loading, bulldozing, clearing land, basement-digging. It's the best machine in its size and power class. I can do again as much work because of its speed in loading. Its maneuverability is very impressive, too."

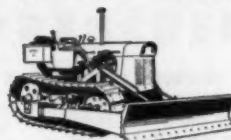
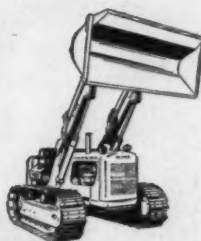
Bring yourself up to date on progress made in loaders...work-try an Oliver OC-126. With "Spot-Turn" steering, it's the nimblest-handling 1½-yd. loader today. And its high-tempo work pace is just the beginning! You're time and profits ahead by Oliver's traditionally higher regard for quality...*demonstrated dependability*. For example, Oliver's "Spot-Turn" steering has wet (not dry) clutches—they run in oil!

**BEFORE YOU BUY ANY LOADER—EVEN LARGER—
TRY A COMPETITIVE DEMONSTRATION OF THE
OLIVER OC-126!**

Also ask about:

**OC-156 loader,
2¼-yd. capacity**

OC-4 dozer and ⅝-yd. loader



THE OLIVER CORPORATION

Industrial Division, 19300 Euclid Ave., Cleveland 17, Ohio

a complete line of industrial wheel and crawler tractors and matched allied equipment

PRESTRESSED CONCRETE BEAMS for U.S. Route 1 Bypass . . .



Cranes lower prestressed concrete beam 95' long, 4' square, and weighing 58 tons, onto piers of one of the middle spans of the 4-span Ridley Creek Bridge. There are 16 beams per span. Note "railway" across creek at bottom of picture, used to trolley one end of beam across creek to crane at right.

● Ridley Creek Bridge, pictured here, is one of seven bridges required in the 8 mile long bypass around Media, Pa. Over 400 prestressed box beams, ranging in length from 40' to 95', were used in these structures.

Factors influencing the choice of this modern bridge construction technique were low initial and maintenance costs, ease and speed of erection, and the trim appearance of prestressed concrete.

In manufacturing the prestressed beams for these bridges, Atlantic Prestressed Concrete Company used Lehigh Early Strength Cement for maximum production efficiency. Units were completed quickly, ready for trucking to the job site as needed.

This is another example of the advantages of Lehigh Early Strength Cement in modern concrete construction.

General Contractor:
Glasgow, Inc.
Glenside, Pa.

Contractor for Construction of Bridges:
McClain Construction Co., Inc.
Philadelphia, Pa.

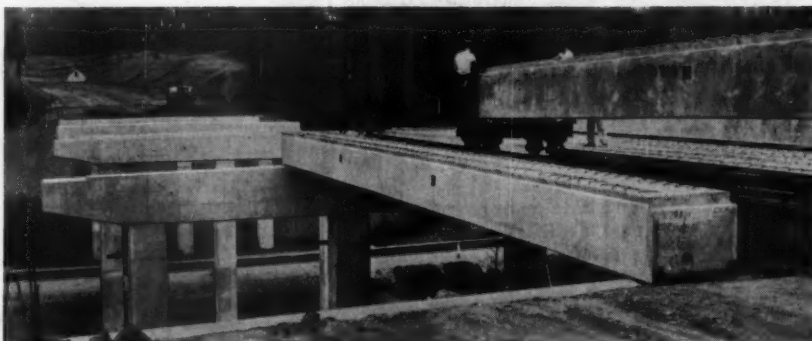
Manufacturer of Prestressed Beams:
New Castle, Del. Plant,
Atlantic Prestressed Concrete Co.
Trenton, N. J. (wholly-owned Subsidiary of
Warner Co., Philadelphia, Pa.)

Ready Mixed Concrete for Beams Supplied By:
Warner Company
Philadelphia, Pa.

Placing one of shorter beams for end span at Ridley Creek. Mobile crane (out of picture to right) is moving beam on rail dolly out to meet crane stationed on creek bed below. The two cranes then move beam to final position.

LEHIGH PORTLAND CEMENT COMPANY

Allentown, Pa.



of the tire at the time of manufacture, and sufficient tension is exerted to open the beads and hold them open permanently.

For mounting, the tire is wheeled into position, raised to the desired height, and secured on the wheel. Then the steel strap is cut, and the tire is inflated to the proper pressure.

Usually, tire beads are jacked open and wood blocks or cardboard separators inserted to keep the beads open. For mounting, a chain with a ratchet is placed around the circumference of the tire. It is pulled tight, and the pressure forces the beads open for removal of the separators and for mounting the tire.

In addition to the 2-in.-wide strap, the materials required are stretchers, sealers, shears, and seals. A coil holder is also available.—**The Brainard Steel Div., Sharon Steel Corp., 2000 Griswold St., Warren, Ohio.**

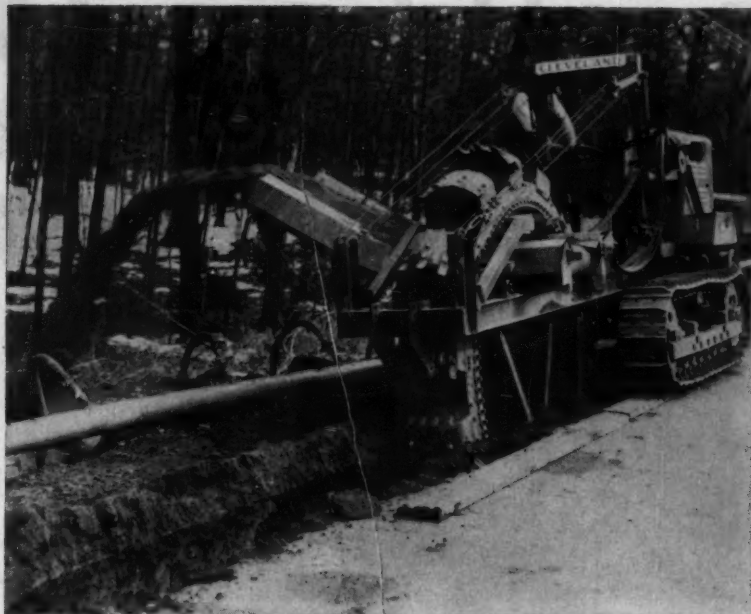


Versatile Tractor Crane

The boom on Drott's tractor crane rotates 360 deg continuously, extends, retracts, or rises 75 deg from the horizontal. It extends 8 ft 6 in.; cable speed is 50 fpm. All controls are hydraulic, and the various boom operations can be performed simultaneously.

The unit's overall length is 102 in., and the width is 54 in. The platform is 54x54 in. Platform space on one side of the crane permits handling of pipe or other long objects. Capacity of the 20RM2 Go-Devil is 2,000 lb.

The Rotelift boom is available independently for truck or stationary mounting. A 5,000-lb capacity Go-Devil is also available. The boom on this model 50RM2 extends to 18 ft.—**Drott Manufacturing Corp., 3126 South 27th St., Milwaukee 15, Wis.**

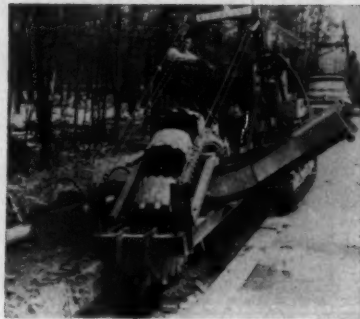


J-30 with hydraulic V conveyor boosts trench production 200%

This Cleveland J-30, digging heavily gravelled frost to 30" depth, helped Industrial Maintenance Co. of Lansing *triple* daily trench production for conduit installation at Battle Creek, Mich. The job was well pointed because of a 3½' water table.

The J-30's V conveyor—hydraulically shifted, controlled at operator's seat—discharged spoil to far side of the well point system (above) or to near side (right) without interrupting digging or crawler's forward movement. Dual independent hydraulic drives gave operator fingertip control of conveyor speeds and discharge direction.

The J-30's long-lived, 1,000-hour-lubricated track has double-flanged sprockets, rollers and wheels, drives on each end of



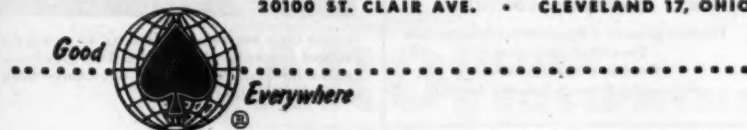
1½" hardened pins. Operators particularly like the trencher's balance on its long crawlers, and its easy steering and maneuverability with big 16" x 3" hydraulic brakes. Digging range is 13" to 24" wide, down to 5½' deep.



Get Bulletin L-104 on Cleveland "J" trenchers from your distributor or write:

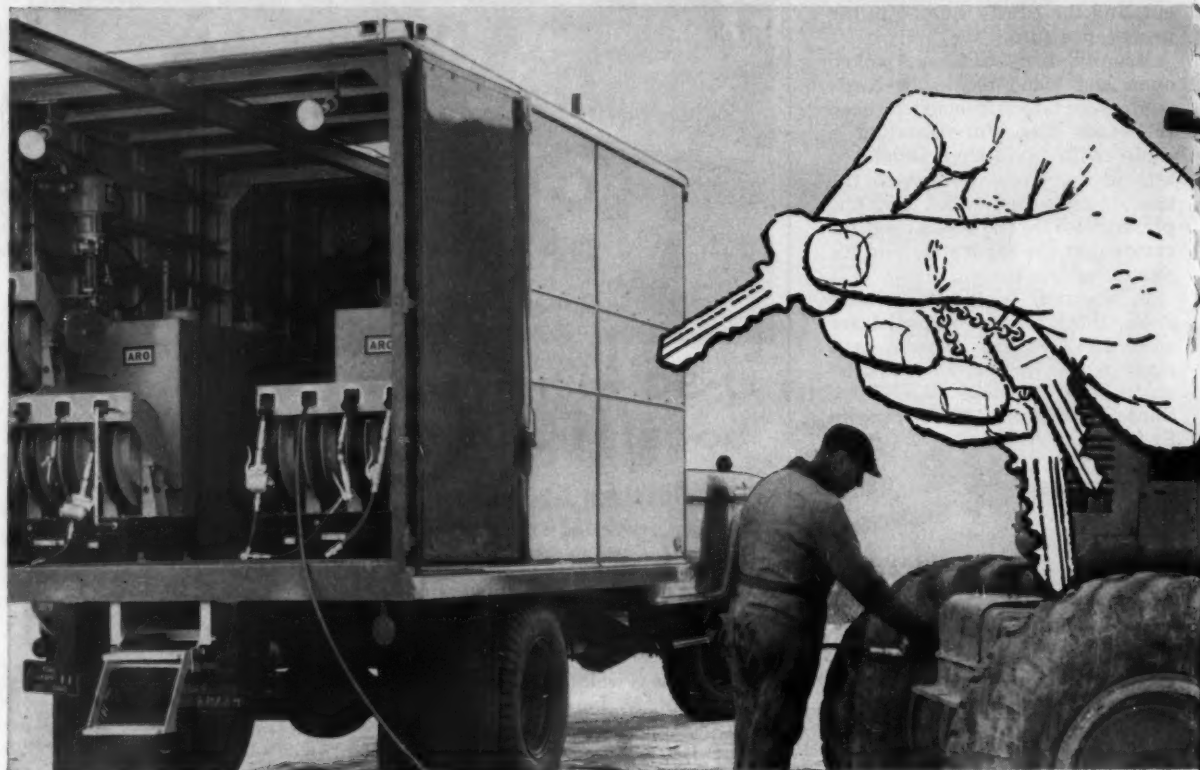
The CLEVELAND TRENCHER Co.

20100 ST. CLAIR AVE. • CLEVELAND 17, OHIO



Beat high cost of Downtime!

NEW **ARO** CUSTOM-BUILT

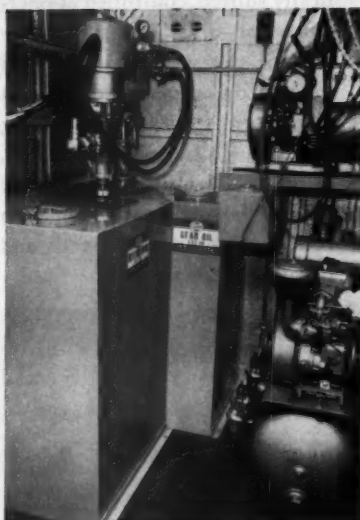


PROPER LUBRICATION WITH ARO LUBE-VAN PAYS FOR ITSELF!

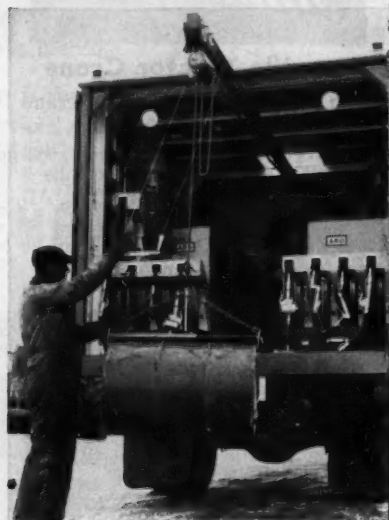
- 1 Best protection for heavy equipment—which may be an investment of several million dollars on one spread.
- 2 Better control of equipment maintenance costs—estimated at 20% of total highway dollar.
- 3 Prevents costly downtime. Lost production time on thirty yard scraper can cost \$75 to \$100 per hour. Breakdown of key piece of equipment shutting down other equipment can cost as much as \$1000 per hour in lost production.
- 4 Lubrication cost is small. The lubricants—plus handling, storing and dispensing—represents less than 1% of total highway dollar. Similar small percent on other heavy construction.

Keys to Proper Lubrication

Product Quality • Application Information
Simplified Lubrication
Field Engineering Service
Adequate, Prompt Delivery Service



Service units are self-powered by air compressor and generator shown here. This gives you around-the-clock lube service anywhere—with an ARO Lube-Van!



Air hoist with trolley simplifies loading. All units installed for most efficient operation . . . engine oils, gear, chassis, track, hydraulic, air, water, solvent.

LUBE-VAN

A TURN-KEY JOB!

Factory-Built By Lube Equipment Engineers To Your Specs... Tested and Delivered To Your Site Ready To Roll!

Another ARO first! You've got to keep bearings, engines and precision surfaces *lubricated*—to keep your big rigs rolling and your downtime down! This calls for a custom-engineered mobile lube unit to give you on-the-job lubrication when you need it, where you need it . . . 24 hours a day!

Now ARO Engineers have solved this problem for you—after more than two years of studying your needs on hundreds of construction sites—coupled with development work, field-testing and proving by ARO's staff of lube engineering specialists.

This new concept is a far cry from makeshift methods. Here's what ARO offers—

Engineering . . . Custom Service for every con-

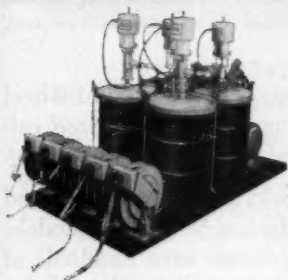
tractor requirement. An Aro Field Engineer works closely with you to coordinate your needs with Oil Company recommendations. ARO will submit planned drawings of proposed Lube-Van . . . make sure of correct weight distribution . . . recommend truck and van specifications.

Equipment . . . The ARO Lube-Van is self-powered. All pumps and reels are heavy-duty all-weather type—specialized for contractor needs. A completely engineered unit for fast, safe, clean lube service. Speeds up lubrication! Each Lube-Van factory-tested with actual products before delivery. Reaches site ready to go—a turn-key job!

SALES AND SERVICE by qualified ARO Field Personnel and facilities in all territories.

LUBE RIGS, LUBE VANS for All Contractor Needs!

ARO offers a wide range of Lube Rigs and Lube Vans which provide all services normally required for earth-moving and construction equipment lubrication. ARO Model 649-051 Lube Rig at left is widely used by large contractors. It is self-sufficient and ready for work anywhere—on a flat bed truck or at your maintenance area.



ASK ABOUT ARO'S LONG TERM CONTRACTOR FINANCE PROGRAM

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Send for new catalog showing ARO's complete line of Heavy Duty Lubricating Equipment for Contractors.



THE ARO EQUIPMENT CORPORATION, Bryan, Ohio

Aro of Calif., 3141 S. Grand Ave., Los Angeles 7, Calif.

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LUBE EQUIPMENT



New Ford F-100 4-wheel drive Styleside pickup handles heavy loads and makes its own road.

**ALL FORD-BUILT . . .
FACTORY-ENGINEERED . . .
FOR GREATER SAVINGS!**

Go Ford-ward for 4-wheel drive performance at big Ford savings. New Ford 4 x 4 Pickups have the power and traction to go most anywhere. They're factory-engineered from the ground up for extra stamina, and all Ford-built with your choice of economical Short Stroke power—Six or V-8.

There's new versatility too, with two power take-off points in the transfer case to drive winches, saws, diggers, or other equipment. And there's new driv-

ing ease. You shift smoothly between 2- and 4-wheel direct drives while moving. Ford's *driverized* cab provides new riding comfort and modern styling.

Ford 4-wheel drive trucks are available in $\frac{1}{2}$ - and $\frac{3}{4}$ -ton pickups, chassis-cabs and $\frac{3}{4}$ -ton stake models. See your Ford Dealer . . . and save hundreds of dollars on America's lowest-priced 4 x 4's with Six or V-8 engine!

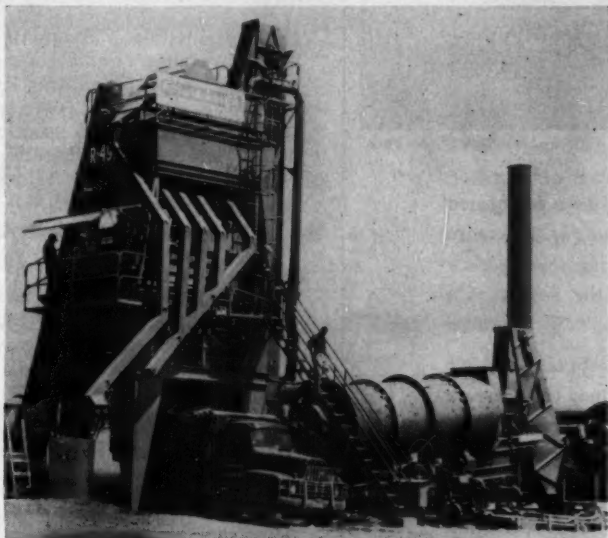
**FORD TRUCKS
COST LESS**

LESS TO OWN . . . LESS TO RUN . . . LAST LONGER, TOO!

Electric Motors Power Wheels, Boom, Outrigger

Two electric cranes now employ the electric wheel drive developed by R. G. LeTourneau. There are no friction clutches in the drive train or the crane operating mechanisms. All operating functions are electrically powered. The cranes can set their own outriggers and be ready to lift capacity loads within 30 seconds. The outriggers are individually controlled from within the operator's cab. The central power plant consists of LeTourneau dc generators coupled directly to Cummins NHBI-600 diesel engines.

The R-30 and R-45 cranes have capacities of 30 and 45 tons respectively. The R-45 can lift a 14,000-lb load at a radius of 60 ft with a 60-ft boom. Without outriggers it can handle 10,000 lb over the back of the crane.—R. G. LeTourneau, Inc., 2399 South MacArthur, Longview, Texas.



Automatic Relay System Controls Asphalt Production

A fully automatic sequence relay system governs the measurement of asphalt and aggregates and the discharge of the mix. A multiple-weigh hopper system permits simultaneous weighing of all aggregate sizes.

Another feature of the improved Barber-Greene Batchomatic asphalt plant is a built-in "mechanical memory" that permits the presetting of various mix specifications. It can be switched from automatic to manual operation and instantly returned to any of the preset specification mixes.

Vibrating screens are adjustable for all sizes and quantities of aggregate. A flow selector permits direction of the flow from any screen cloth into two or three different bins.

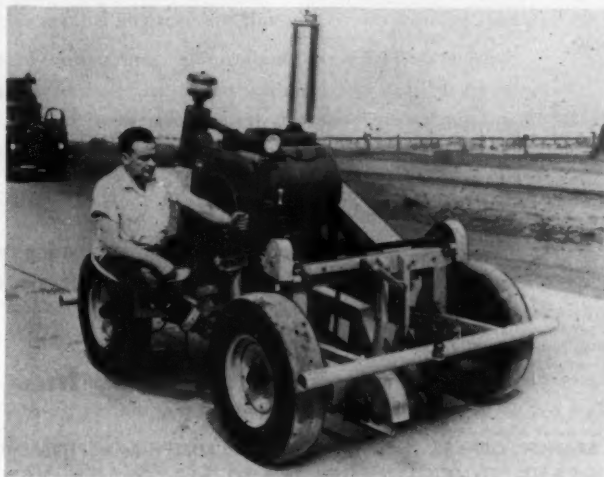
—Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill.

Self-Propelled Saw Cuts Concrete Control Joints

Two independently controlled tandem cutting heads on this saw cut longitudinal joints in concrete slabs. A direct reading gage indicates the depth of cut at all times.

A 56.5-hp Wisconsin engine powers the Clipper C-560 longitudinal concrete saw. The Graham transmission gives it speeds of up to 35 fpm in forward or reverse.

All controls are grouped around the operator's seat. The machine pushes a centerline guide frame that rides on the edges of the slab. It eliminates the need for marking the centerline. A pressure equalizer spring on each cutting head cushions the blade shock. The unit runs on four smooth tread tires.—Clipper Manufacturing Co., 2800 Warwick, Kansas City 8, Mo.



THE IROQUOIS DAM...

A RECENT S & H FOUNDATION INVESTIGATION AND PRESSURE GROUTING PROJECT



Photo courtesy of Power Authority of the State of New York

Thousands of feet of drilling and sampling were performed for the initial planning of the Iroquois Dam (St. Lawrence Seaway). The accurate soil samples and high quality rock cores recovered contributed materially to the design of a suitable and firm foundation.

In the second phase of our work on the Iroquois Dam we drilled the necessary grout-holes and performed the pressure grouting. Completely sealing off the faults and cavities that our drilling revealed required the injection of over 10,000 cu. ft. of cement grout.

Other St. Lawrence projects on which Sprague & Henwood services were utilized include the Long Sault Dam, the Barnhart Island Power Dam and the Massena Intake.

Sprague & Henwood's unbeatable combination of experienced drilling and grouting personnel, modern equipment, and expert supervision is your assurance of the satisfactory completion of your work. Behind this combination is over 75 years of accumulated knowledge and experience in the drilling field.

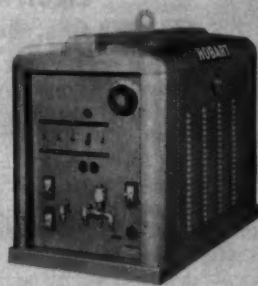
For foundation investigation and pressure grouting required for tunnels, buildings, dams, bridges, or highways, contact the Sprague & Henwood branch nearest you.

SPRAGUE & HENWOOD, Inc.
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EQUIPMENT NEWS . . . continued



Portable Welding Package

TIGPAK is a package for tungsten inert gas shielded arc welding in remote locations. For operation, only the usual welding cables are required to connect this unit to the welding machine. Without water the unit weighs 180 lb.

Welding components in this package include a magnetic gas valve, welding circuit contactor, controls, and a circulating water cooling system with its own water supply. The unit also produces a high frequency for stabilization and initiation of the arc. Portable mountings are optional.

The unit is specially designed for use with ac gasoline engine driven welders with 200 or 300-amp capacity. It may also be used with dc welders, but a 110-volt ac power source must be available.—Hobart Brothers Co., Hobart Square, Troy, Ohio.

Two Crawler Tractors

Six-cylinder, direct-starting diesels power Internationals' two new crawler tractors. The turbo-charged International D-282 engine powers the TD-9 tractor. Maximum horsepower is 66. The Naturally aspirated version of the D-282 engine powers the TD-6 tractor. It develops 52 hp. Both tractors are equipped with dry-type, full-face, sintered metal engine clutches.

Operating weight of the TD-9 is 11,430 lb. It pulls 11,720 lb at 1,700 rpm. The TD-6 has an operating weight of 8,665 lb. It pulls 8,715 lb at 1,550 rpm. Both units are available with four or five-track roller frames. The tractors have five speeds forward and one in reverse. Two-speed reverses are optional. — International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.

10 minutes for complete pump overhaul...

Why put up with expensive down time and high repair costs?



on the spot maintenance with

VICKERS

"High Performance" Pumps* keeps your jobs on schedule

*PATS. & PATS. PENDING

Without removing the pump from the vehicle, and without disconnecting hydraulic lines, the new Vickers "High Performance" pump can be completely overhauled by simply inserting a new pumping cartridge. The pumping cartridge contains all wearing parts in one replaceable unit and results in new pump performance. Write for Bulletin No. M5108 for performance characteristics.

2 min

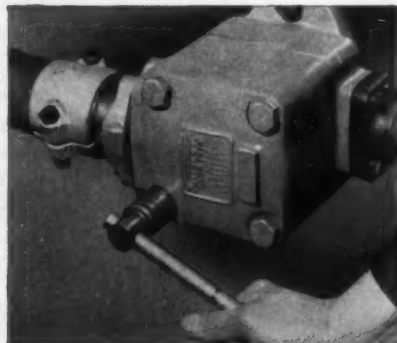
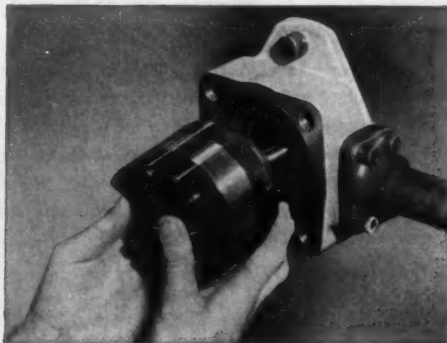
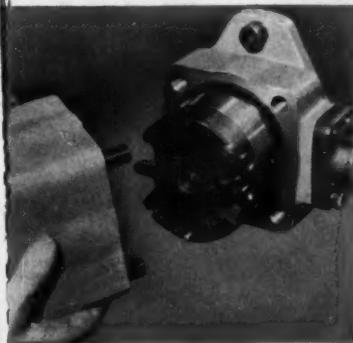
1. After safety, cleanliness and draining instructions have been followed per vehicle manufacturer's recommendations, take out four cover bolts and remove cover.

5 min

2. Take out old pump cartridge and insert new one. The cartridge includes cam ring, rotor, vanes, etc. —all parts in one assembly.

10 min

3. Replace cover and you have the equivalent of a new pump ready for long, trouble-free service.



VICKERS INCORPORATED

DIVISION OF SPERRY RAND CORPORATION

Mobile Hydraulics Division

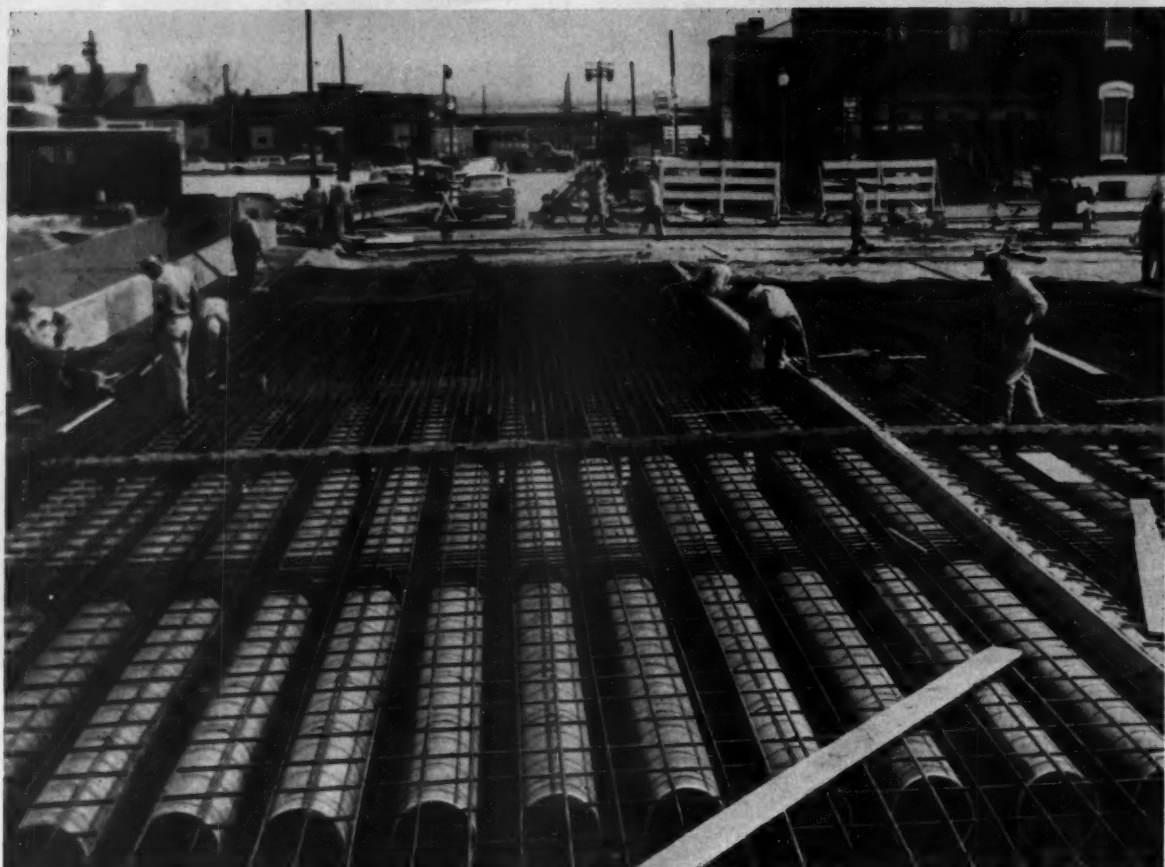
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ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921



saving concrete . . . reducing weight . . . maintaining strength with FIBRE TUBES and LACLEDE REINFORCING BARS

Millions of cubic yards of concrete are being poured into St. Louis' big new system of freeways—one of the most enterprising urban highway building programs in the country.

In this overpass section of the Mark Twain Expressway between downtown St. Louis and northwest suburbs, concrete and weight are both being saved without sacrifice of strength. 15¾"-diameter fibre tubes, inclosed in a grillwork of Laclede Multi-Rib Round Reinforcing Bars, form the core of the 24½"-thick deck. While volume and mass are substantially reduced, the Laclede-reinforced deck maintains full load-bearing capacity.



MISSOURI HIGHWAY DEPARTMENT

Project No. 1-70-5(23)242

Mark Twain Expressway, St. Louis Ave. Bridge

Contractor: Fred Weber Contractor, Inc.

LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI

Producers of Steel for Industry and Construction

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Maxi
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coati
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gasol
Inc.,
10th
Minn



Immersion Container For Cleaning Solution

Permatex's cold parts cleaner is available now in a 1½-gal immersion container. It holds a gallon of highly concentrated cleaning solvents and has a water seal to prevent evaporation of the solvents.

A perforated steel immersion basket with a handle holds the parts to be cleaned in the solution and permits easy draining and recovery of the parts. The container's extra capacity allows cleaning a basketful of small parts without spilling the solvents.

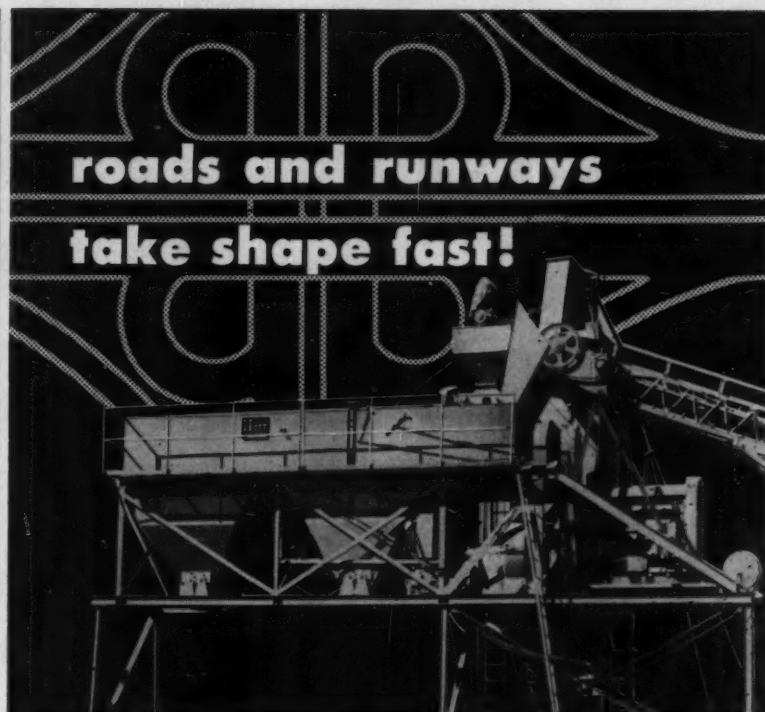
Cold parts cleaner is also available in a 1-gal replenisher can without basket; in a 6-gal container, holding 4 gal of cleaner and an immersion basket; in a 6-gal container without basket; and in larger sizes. A 55-gal drum contains 40 gal of cold parts cleaner for use as a dipping tank. —Permatex Co., Inc., Huntington, N.Y.

Diesel Power For Pneumatic Roller

A diesel-powered version of the Bros model SP-54B roller (CM&E, Feb., p. 176) is now available. The new unit is designated the model SP-54B-D.

A Hercules DD-226 four-cylinder diesel powers the roller. It is rated at 65 hp. A torque converter is standard equipment. Maximum speed is 20 mph.

Wheels are equipped with plastic scrapers for asphalt or seal-coating compaction work. Other features are the same as on the gasoline-powered model. —Bros, Inc., Road Machinery Div., 1057 10th Ave., S.E., Minneapolis 14, Minn.



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take shape fast!**

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Highway and airstrip stabilized bases take shape twice-as-fast when you have twice-the-capacity . . . with the industry's first 1000-tph Central-Mix Stabilization Plant, by Boardman.

This plant was built by Boardman with the contractor in mind . . . to cut his production costs and increase his profits. It outproduces all others, yet remains in a competitively-priced field. Exclusive Boardman features like the double discharge hoppers add more speed in loading, increase your efficiency.

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Waco . . . the complete line of scaffolding, offers you one-source convenience and service for all scaffolding needs.

Waco scaffolding, with patented job-proven *Speedlock* is the fastest, most economical scaffolding available.

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LICENSEES:

Tubular Structures Corp. of America Los Angeles, Calif.
Armstrong Iron Works Windsor, Ontario

EQUIPMENT NEWS . . . continued



Easy to Move

An addition to Manitowoc's line of excavators is a 2½-yd shovel. It can be dismantled easily for transportation by removing the complete crawler assemblies. The counterweight is self-removing. Overall outside width is 11 ft 1 in. The model 3100 converts to clam-shell, backhoe, dragline, or crane.

The self-cleaning crawler drive features positive steering in either direction and the ability to idle or lock either crawler. Other components include air controls, a torque converter, a swing lock, disc-type clutches, and forced ventilation. An independent swing feature and an erector's crane are optional.—**Manitowoc Engineering Corp., Manitowoc, Wis.**



Power Fastening Tool

The Hilti DX-100 is a power-assisted drive tool for fastening into concrete, steel, and all types of masonry. It uses a power assist behind a drive piston instead of behind the fastener, eliminating any free-flying fasteners.

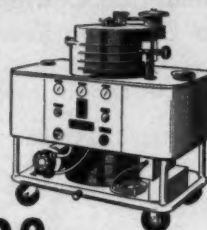
This tool is designed to use most of the presently available fasteners where threaded studs, drive pins, and drive ring fasteners are used in lengths up to 4 in. Hilti conic studs and pins made of chrome vanadium alloys are also available. These are rust-proofed and specially tapered for maximum holding power.—**Hilti Rapid Fastening Systems, Inc., 73 Southfield Ave., Stamford, Conn.**

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SOMEBODY HAS

Turbo Model L-150 is an oil-fired unit built for continuous, uninterrupted production. No burn-out. No coil-clogging. No blow-back. No service problems with pumps. Moves easily right to the job on rubber-tired wheels, swiveled for turning. For steam-cleaning, paint-stripping, phosphatizing. Pays for itself in maintenance time saved.

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TURBO MACHINE COMPANY
LANSDALE, PA.

NEW ¾-ton Pull-A-Way Added to **WRIGHT** TYPE "C" LINE!

**FOUR SIZES - ¾,
1½, 3 and 6 Tons**

FEATURES

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- Hooks are drop-forged
- Special alloy-steel chains
- Chain sheaves of drop-forged alloy steel
- Gear teeth cut to precision limits
- Load brake is dependable and safe
- Weights:
¾-ton, 14 lbs.
1½-ton, 23½ lbs.
3-ton, 36½ lbs.
6-ton, 63 lbs.



New ¾-ton model

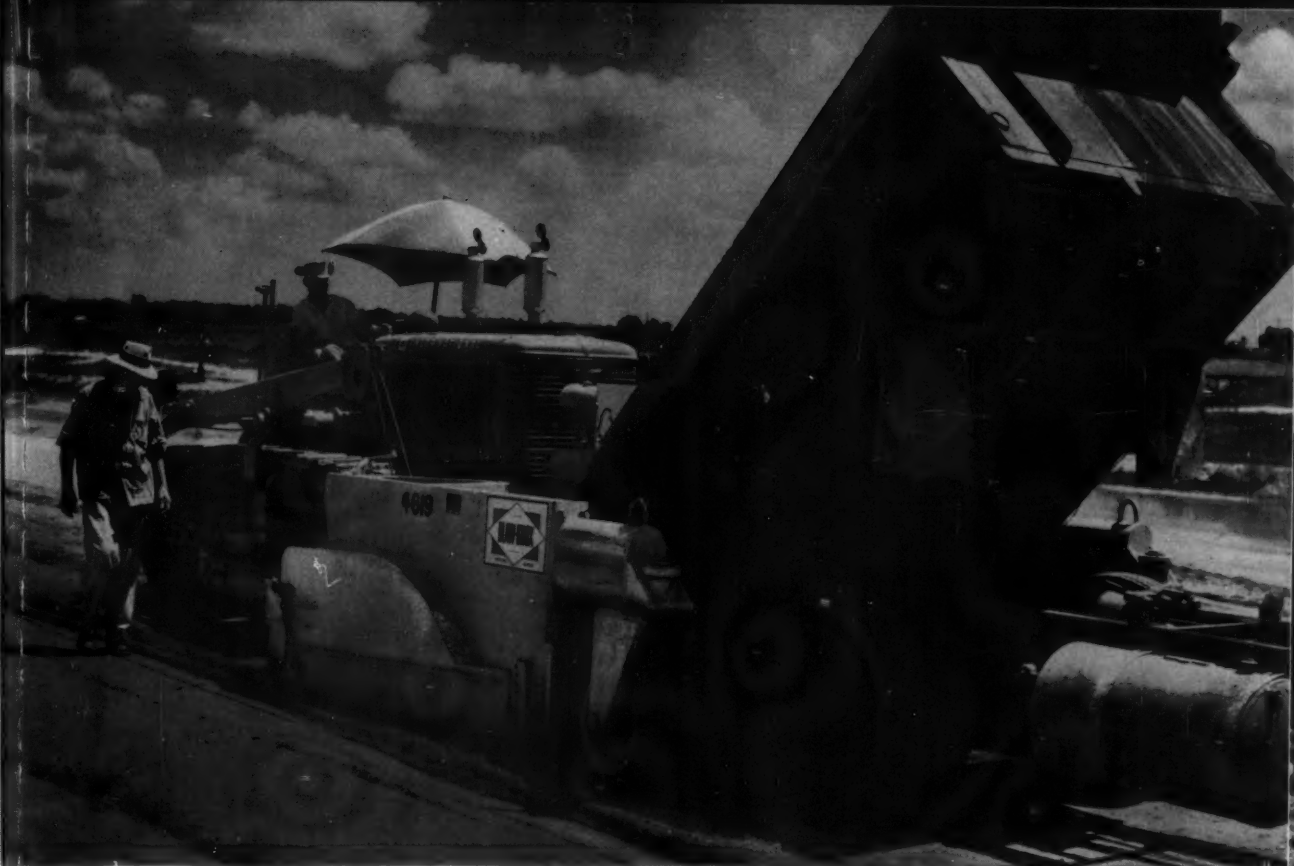
- VERSATILE
- LIGHTWEIGHT

Write to York, Pa., office for
complete information



Wright Hoist Division
AMERICAN CHAIN & CABLE

York, Pa., Bridgeport, Conn.



Blaw-Knox P-160 at work on Interstate By-Pass 35 outside Oklahoma City. Pugmill mix was laid down to 8-inch depth, 14-foot width at a rate averaging better than 600 TPH.

65,000 tons of Macadam base through this P-160 without downtime!

Amis Construction averages 600 TPH with 15% more compaction

"We selected the Blaw-Knox P-160 Base Paver attachment because of superior design features like the oscillating screed and wide-spread wheels. Since we began using it in July, we've put down more than 65,000 tons of Macadam base course with water binder, without any downtime or maintenance difficulties," says John R. Waugh, project manager for the Amis Construction Company, Oklahoma City, Oklahoma.

"We've experienced a big reduction in equipment requirements over our previous method of spreading with blades. The V-type hopper eliminates the material segregation problem. And the real extra

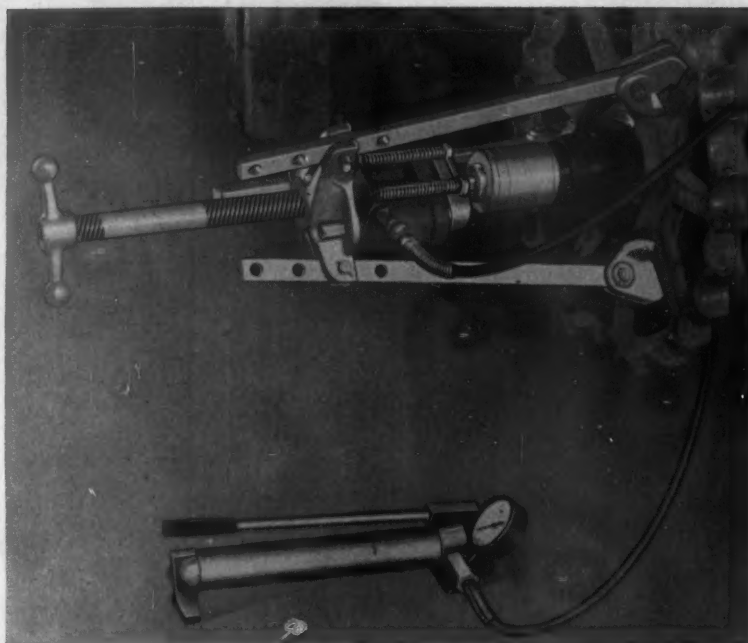
feature on the Blaw-Knox P-160 is the oscillating screed that knits the material in place. That gave us the extra compaction that permits our roller operators to work without fear of pushing the base course before the rollers. It's an important feature when matching adjoining passes too," he adds.

Specially engineered—rugged Blaw-Knox paving equipment like the P-160 Base Paver attachment enables contractors all over America to keep ahead of contract obligations, at a profit. If you would like a technical report on Amis' experience with the P-160, check your Blaw-Knox distributor. Or you may wish to write direct.



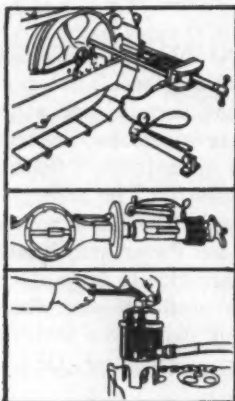
BLAW-KNOX COMPANY

*Construction Equipment
300 Sixth Avenue
Pittsburgh 22, Pennsylvania*



One man pulls sprocket in minutes... on-the-job...with OTC puller-installer

One man, in minutes can pull or install a tractor sprocket on-the-job with an OTC hydraulic puller-installer set. Saves hours, even days, of costly down-time. Special pullers with up to 100 tons of hydraulic power are designed in co-operation with major tractor manufacturers to do all types of maintenance jobs—fast—without damage to parts. One basic hydraulic unit with special attachments will handle a variety of tractors.



VERSATILE RAM AND PUMP AVAILABLE FOR MANY OTHER JOBS

Track Master Pin being removed with same Power-Twin ram and pump plus accessories. Pin is removed—installed in minutes. Hand, electric or gas driven pumps available.

Truck Axle Tube being removed with OTC Hydraulic unit and accessories. Same unit installs tube—fast—without distortion.

Valve Seat Insert being pulled with 17½-ton Power-Twin ram and pump. Takes little effort and does not damage cylinder head. Three sizes fit most engines.

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EQUIPMENT NEWS... continued



Performance Gages

Two new dash-mounted accessories for cars and trucks are a battery condition indicator and a performance gage.

The model 424 indicator continuously indicates generator and regulator operating efficiency and registers battery condition each time the vehicle engine is started.

The 414 performance gage shows miles per gallon at all speeds and indicates the most economical driving range. The three-color dial also shows when tune-up adjustments are needed.

Both gages are housed in cases and supplied with fittings, adapters, and complete installation instructions.—King Electric Co., 9123 Inman Ave., Cleveland 5, Ohio.

Versatile Lift Truck

A new 2,000-lb capacity lift truck stacks to a maximum height of 131¼ in. It has an overall lowered height of 83 in. and a 16¼-in. free lift.

The new rig, called the FTP 20-24, is powered by a four-cylinder gasoline or LP fuel engine. Both deliver 35 brake horsepower at 2,400 rpm. A two-speed, constant-mesh transmission is standard equipment.

The pneumatic-tired truck has an overall width of 36½ in., outside turning radius of 70 in., and center-point steering that permits turning in a minimum radius in either direction. Attachments and accessories include clamps, side shifters, load back rests, and overhead guards. — Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Preventive Maintenance At Work



Purolator saves money for Material Service Corporation

About a year ago oil bath air filters were removed from a number of trucks and compressors operated by the Material Service Corporation, Lyons, Ill. They were replaced with Purolator Dry Type Air Filters.

Once a week, thereafter units were inspected, checked with manometer gauge and results logged. Two months after installation, elements were removed for the first time, cleaned and put back into service.

For the Material Service Corporation, the result was clear-cut proof that vehicles equipped with Purolator Dry Type Air Filters could be operated over periods of 6 to 8 weeks

without element servicing; that dry-type air filters could be used up to three months without element replacement; "that savings up to \$1000 per year per truck could be effected."

Results on the compressors were equally as good, bearing in mind that the compressors were run on a tighter 24-hours-a-day schedule.

None of this is surprising. With Purolator Dry Type Air Filters all of the air must pass through the filter before reaching the engine. What's more, unlike oil-bath filters which depend on engine speed for peak performance, dry-type filters work at maximum efficiency regardless of en-

gine speed. In fact, they gain in efficiency as the dirt load increases.

This positive protection extends periods between overhauls, helps prevent major repairs and wasteful down time. Maintenance expenses are lower, too. Low initial cost, re-use, easy changing assure this.

There are Purolator Dry Type Air Filters for all makes of trucks and industrial engines.

For complete information, send for a free catalog, or call your nearby Purolator Supplier.



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PUROLATOR PRODUCTS INC. Rahway, N. J.; Toronto, Ontario, Canada



Bethlehem Form Stakes Easy to drive for fast anchoring

The strong projectile point on Bethlehem Form Stakes quickly penetrates even the hardest road base . . . speeds the anchoring of steel forms for highway work.

HIGH-STRENGTH STEEL

Bethlehem Form Stakes are made of high-carbon, high-strength steel. They can be driven with a sledge or with power tools. You can really treat them rough, for they have the toughness to withstand repeated battering. They are economical, too, because these rugged stakes can be pulled out and re-used, time after time.

BUNDLED FOR EASY HANDLING

The stakes are made in any diameter and can be furnished in various lengths. They come well strapped in one-man bundles which are easy to handle and store.

OTHER STYLES AVAILABLE

In addition to the plain-end stake which is commonly used, Bethlehem Form Stakes can also be supplied with chamfered ends and with upset ends, to meet special needs. Tell us about your requirements. Get in touch with the Bethlehem sales office nearest you. Or write to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

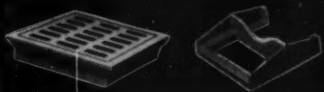
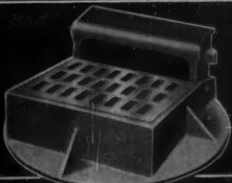
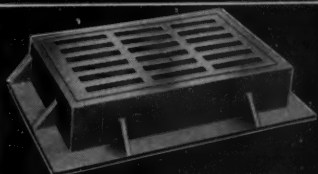
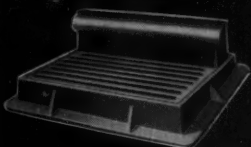
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EQUIPMENT NEWS . . . continued



Loaders for Utility Tractors

A pair of loaders for mounting on utility tractors has a breakaway power of 2,500 lb. The L-100S has a single bucket cylinder and the L-100D has two bucket cylinders. Lift and bucket cylinders are double acting on both models.

The L-100 series loaders have adapter brackets for mounting on the following tractors: International Harvester 240 and 340, Allis-Chalmers D-14, John Deere 430W and 430U, Ford 600-800, Ferguson 35, Massey-Ferguson 202, Oliver 550, and Case 310.—Henry Manufacturing Co., Inc., Topeka, Kan.

Fully Automatic Truck Transmissions

Full power shifting with no interruption of power to the wheels is a feature of ReoMatic truck transmissions. These fully automatic Allison MT-30 and MT-40 transmissions are manufactured by the Allison Division of General Motors. They are matched to the Reo OH-170, OH-185, and OV-235 Gold Comet engines.

The transmissions include a torque converter, constant mesh planetary gears, a hydraulic control system, and a hydraulic retarder. The hydraulic retarder controls truck speeds on downhill runs generally without help from brakes. A pedal in the conventional clutch position operates the retarder. It acts on the vehicle's driveline, minimizing wear on the conventional brakes.

These transmissions also feature two converter-driven power take-off positions, one on each side of the transmission. The torque converter absorbs shock if auxiliary equipment stalls suddenly. Engine throttle controls the operation of the auxiliary equipment.—Reo Division, The White Motor Co., Lansing, Mich.

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SOLID POWER of a Remington concrete vibrator

You're looking at the business end of Remington's new Model EV-25 motor-in-head vibrator. Users say it's the best electric motor-in-head vibrator made, and Remington guarantees it for 6 months. The Model EV-25 is just one of 11 concrete vibrator models available from Remington. Ratings range from 1 to 6¾ hp in air, electric or gasoline-powered models. Interchangeable shafts, housings and heads enable equipment to be adapted to widely varying conditions. Mail coupon or write for performance data and specifications on the new Model EV-25 and the complete line of Remington concrete vibrators.

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Please send—without obligation—catalogs on Remington Contractor & Industrial Tools checked below:

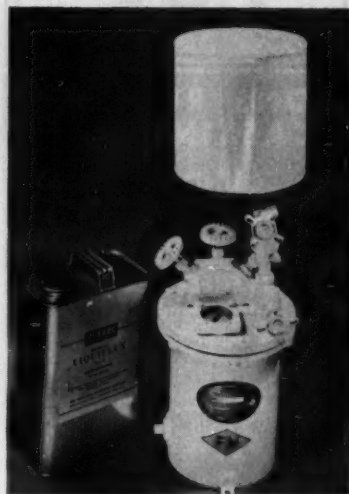
☐ Concrete Vibrators ☐ Air Tools ☐ Electric Tools ☐ Flexible Shaft Machines ☐ Chain Saws ☐ Stud Drivers

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Company _____

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Braze Welding Aids

The new Rexarc Liquifluxer permits a constant flow of flux for braze welding. No wicks are used, and no shutdown of operation is required for replenishing the flux supply. There are separate valves for inlet, outlet, and bypass of the gas. A non-clouding liquid level gage indicates the amount of flux in the fluxer at all times.

The improved Liquiflux is vaporized and inducted into the gas stream and passes through the welding torch into the flame without the need for a special torch. As the flame contacts the metal part, the flux in the flame cleans and fluxes the parent metal for brazing. No pre-cleaning is required.

Liquiflux may be used for brazing non-ferrous metals to steel and iron and for welding copper, brass, bronze, cast iron, and malleable iron. One gallon of flux will process approximately 2,500 cu ft of gas.—The Sight Feed Generator Co., 38 E. Third St., West Alexandria, Ohio.

New Fleet Motor Oil

Cities Service Oil Co. has announced a new motor oil for fleet use. The C-300 oil is recommended for use in both diesel and gasoline engines. The manufacturer says the oil gives good cold-engine sludge protection and prevents formation of varnish during hot-engine driving.—Cities Service Oil Co., 60 Wall Tower, New York 5, N.Y.



Lima 1250 3½-yd. Shovel nears end of million-and-a-quarter-yd. excavating job on highway reconstruction project near Knapp, Wis.

"LIMA 1250 moves half million yards of rock—at 270-300 yards hourly!"

says Lawrence Gerke, Wisconsin contractor

The job was tough, the schedule tight. "In only 2 miles," says contractor Lawrence Gerke, of Merrill, Wis., "we had to excavate a million and a quarter yd. . . . almost half of it rock!"

High performance, low maintenance

The project involved reconstruction on U. S. Interstate 94 near Knapp, Wis. Gerke needed a high performance machine with low maintenance requirements. He says, ". . . After considerable analysis of equipment, we purchased a Lima Type 1250 for rock excavating. In many cases no

blasting was done. Yet, working in this material, the Lima constantly averaged 270 to 300 yd. per hour. When shovel work was completed, the 1250 was easily converted in the field to a dragline."

The crawler-mounted Type 1250 has turned in outstanding performances everywhere as a 3½-yd. shovel, 85-ton crane, and variable dragline.

Air-controlled precision

Main operating and auxiliary functions are air-controlled for smooth, precision performance at full capacity operation. Choice of diesel engine or electric motor with torque converter.

Other features and available equipment include: Independent propel, extra-high-speed hoist attachment, third drum, power reversing hoist drum, two types of rigid and folding gantries. The 1250 can be knocked down to units of less than 60,000 lb. for haulage.

Whatever your job, there's a Lima type and size exactly right—½ to 6-cu. yd. shovels, cranes to 110 tons, draglines variable. Learn now why so many contractors agree with Lawrence Gerke when he says, "We are completely satisfied with the operation of our Lima." See your nearby Lima distributor or write to us.

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The Vibrator that keeps costs calm

You don't have to get excited about costs when you use a Homelite High-Cycle Electric Concrete Vibrator. Only one man runs it, anywhere. Your labor costs less. And, there are more savings to gain. You need no special cradles or scaffolds. You set your Homelite Generator in any convenient spot within a 400' radius, and your man goes to work. Homelite's High-Cycle Vibrator handles 30 to 40 cubic

yards of 2" slump concrete per hour. Works in tight spots or deepest forms without damage to tough kink-proof handling hose. Rugged, high-cycle motor in vibrator head cuts maintenance. Carryable, 143 pound Homelite Generator saves in many ways. Runs one or two vibrators and also operates 110 V. AC-DC electric tools and floodlights. Write for full information, now.

Homelite factory branches are located throughout the country. Your nearest one is as close as your phone. Call them or write for convincing demonstration or rapid service in any way.

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CARRYABLE
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GARDEN KING
POWER SPRAYERS
15 & 30 GAL. CAPACITY



For spraying silicone water repellents for masonry and cement work and many other spraying purposes, Briggs and Stratton Motor, Disc wheels, Agitator keeps spray solution mixed. Very high quality. Built for hard usage. Send for circular.

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Replaces unsanitary bucket and dipper. Portable. Push button faucet. Takes cold, clean water to workers right on the job. 5 gal. steel tank is curved to fit the back. Sturdy construction. Highly popular. Send for circular.



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450 Main St., Utica 2, New York



MAYO Tunnel Cars

... feature practical designs and rugged construction. All cars can be equipped with Mayo's safe, automatic couplers.

- Side Dump Car (shown) has 2½ cu. yd. capacity. 24" gage.
- Rocker Dump Car Ideal for sticky muck or wet concrete. 1 cu. yd. capacity 24" gage.
- Tunnel Car. Box body is removable and may be hoisted to surface to be dumped into truck. ½ to 2 cu. yd. capacity. 18" or 24" gage.

FREE Bulletin No. 18-B shows car details; No. 22 illustrates Automatic Coupler.



MAYO
TUNNEL AND MINE
EQUIPMENT
LANCASTER, PENNA.

EQUIPMENT NEWS...continued



Large Spud Speeds Tire Mounting

Tire mounting is easier and faster with this big tire spud. The SP-4000 spud is designed for use with a swivel stem that fits both tube and tubeless tires on off-the-road equipment. Tire mounting is faster because the new spud eliminates interference from a permanent stem.

A valve cap on the spud retains air pressure until the tire is needed. Then, a one-piece valve stem of correct length is attached to point in either direction. The spud has a built-in nylon check valve to permit inflation, deflation, or gaging. A seal on a tapered seat prevents loss of pressure when valve stems are attached or removed.—Dill Manufacturing Co., 700 E. 82nd St., Cleveland 3, Ohio.



Handy for the Operator

The model 125 "Smooth-Topper" is a one-ton tandem type roller just a step above the ground level.

Fully ballasted, the roller weighs 2,380 lb. A Clinton 4-hp, single-cylinder air cooled engine powers the unit. It has a single-speed transmission. Maximum speed is 1¼ mph forward and reverse. Cocoa mats for front and rear rollers and an operator's seat are optional. Also available is a trailer for hauling the roller behind a truck. — Littleford Bros., Inc., Cincinnati 2, Ohio.

RICHMOND



Most Thruway Contractors use Richmond Products

In the roadbuilding field, where time is money, concrete contractors rely on Richmond to save both. Richmond products are often a major factor in the profit and loss picture.

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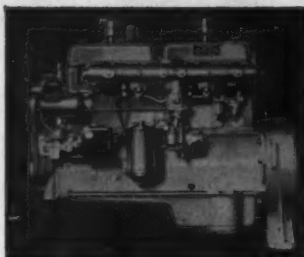
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MARION TRUCK-CRANE

with two

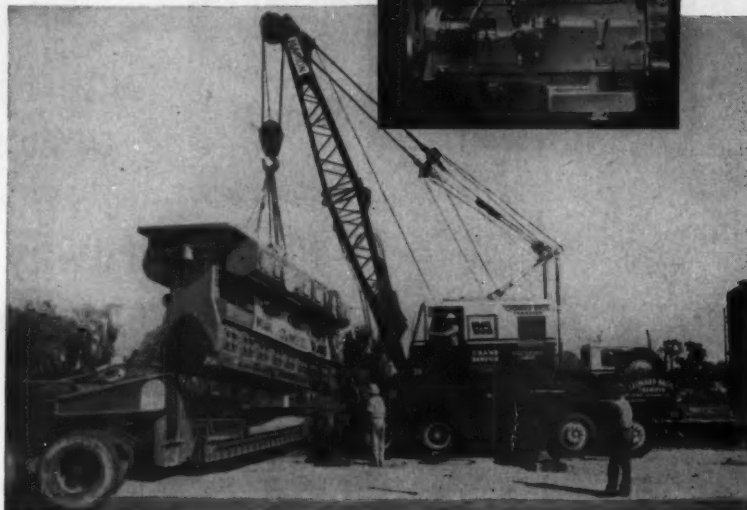
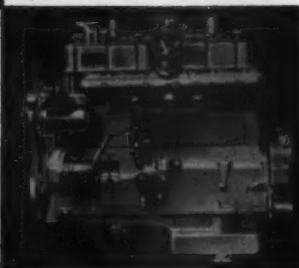
WAUKESHA

ENGINES



▲ **Powering Crane (boom)—140-GK**
Waukesha Gasoline, six cylinders,
4½-in. x 5½-in., 525 cu. in. displ.

Powering the Carrier—145-GKB
Waukesha Gasoline, six cylinders,
5¼-in. x 6-in., 779 cu. in. displ.



Leonard Bros. Transfer of Miami—one of Florida's largest truck-crane users—has worked a wide variety of jobs quickly and profitably with their Marion Type 43-M mobile truck-crane. The upper frame has a Waukesha 140-GK Engine and Twin Disc torque converter; the Henderson Carrier has a 145-GKB Waukesha Engine. The truck crane is shown unloading a 2700 hp Diesel engine from railway flat cars to carry-all truck, later unloaded at power plant in Sebring, Florida. The huge engine with its two components, weighing 34½ tons and 31½ tons, took two separate lifts. Seven parts of line were used with the 43-M's basic 30 ft. boom working at a close radius. Get Engine Bulletins 1548 and 1553.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

NEW YORK

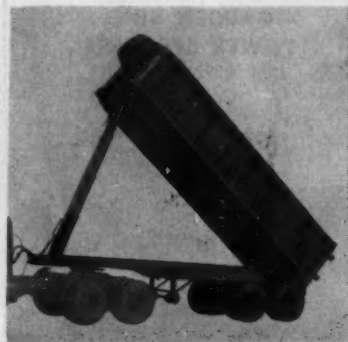
TULSA

LOS ANGELES

Factories — Waukesha, Wisconsin, and Clinton, Iowa

431

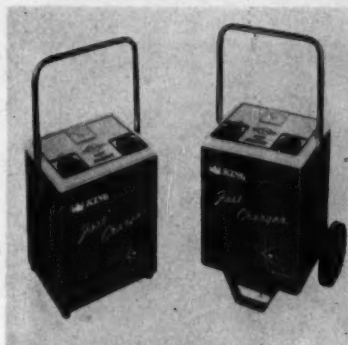
EQUIPMENT NEWS . . . continued



Low Body, Big Capacity

This semi dump trailer is less than 9 ft from the ground to the top of the sides. Lengths range from 18 to 24 ft. Capacity is 16 cu yd and up.

Other features of this steel plate trailer includes a double cap top rail, an I-beam frame, and improved hoist packing. Front mount or underbody telescopic hoists are available. Cross members and rear standards are welded to one integral unit. Size of the 14-ply tires is 11:00x20.—**Jacob Press' Sons, Inc., 501 West 33rd St., Chicago 16, Ill.**



Battery Chargers

A portable model BC-60 and a wheel model BC-61 silicon rectifier type battery chargers are two new additions to the King battery equipment line. Capacities of the two units are 100 amp at 6 volts or 50 amp at 12 volts.

The rectifiers of these chargers are hermetically sealed in ceramic. An automatic-reset circuit breaker prevents damage from accidental overloads. Automatic correction for 6 or 12-volt charging with the output tapering to prevent over-charging is another design feature.—**King Electric Equipment Co., 9123 Inman Ave., Cleveland 5, Ohio.**



Heil HMT-11 Body hauls as much as 1500 lbs. additional legal payload because the body is built lighter with USS MAN-TEN High Strength Steel.

Man-Ten Steel boosts legal payload 1500 lbs.

Robert Hawthorne, Inc., of Philadelphia, one of the largest haulers in this area, wanted the lightest possible body, since they traverse the public streets and roads.

The Heil Company had the right truck body. The new Heil HMT-11, made with USS MAN-TEN High Strength Steel, permitted an extra 1000 to 1500 lbs. per payload.

The greater strength of MAN-TEN Steel permits a thinner gage floor, subframe and sides. The body is just as strong, but because it is made with thinner steel plates it is as much as $\frac{1}{2}$ lighter than an ordinary body. The weight removed from the body goes into the payload.

This truck body will need less maintenance because USS MAN-TEN Steel has good resistance to atmospheric corrosion, abrasion, impact and fatigue.

Ask your equipment supplier about High Strength Steel construction. There are three brands of USS High Strength Steel—MAN-TEN, COR-TEN and TRI-TEN. Each has its own characteristics that make it ideal for certain applications in trucks and truck bodies. Ask, too, about USS "T-1" Constructional Alloy Steel and USS Stainless Steel. See how these steels can reduce weight, increase strength, and lower the cost of your trucking operation.

USS, MAN-TEN, COR-TEN, TRI-TEN, and "T-1" are registered trademarks



United States Steel Corporation—Pittsburgh
American Steel & Wire—Cleveland
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
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United States Steel

Knuckles right down to any job!

This rugged heavyweight asks no quarter, it just wades right in and polishes off tough hauling jobs. Two high-capacity "live" rear axles give it better flotation and traction on soft ground. And its 234-hp. engine, with dual carburetors standard, gives this T900 tractor the big-chested power to handle the big hauling jobs without tiring.

The new Dodge tandems are packed with features that make heavy-duty hauling easier and more profitable: New instrument clusters, with tachometer and graduated ammeter and oil pressure gauges standard . . . suspended brake and clutch pedals . . . 90-degree-opening hood for easy servicing . . . air brakes standard on T900 models . . . up to 20 speeds forward. But see your Dodge dealer—and get the *heavy-duty* reasons why . . .

today,
it's real smart
to choose **Dodge**
Trucks



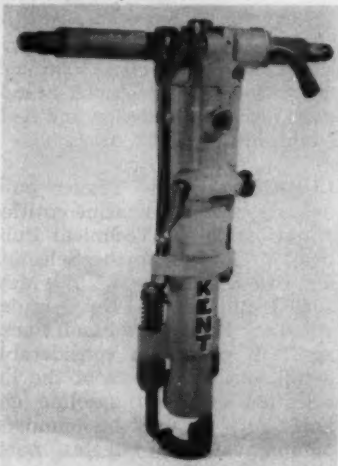
Built throughout for dependable heavy-duty service, this 354-cubic-inch V-8 has dome-shaped combustion chambers . . . double rocker-arm shafts . . . precision timing gears instead of chains . . . positive exhaust-valve rotators . . . hydraulic tappets . . . sodium-cooled exhaust valves. And it develops full power on thrifty regular gas!



Self-Spraying Containers

A line of maintenance and production aids for a wide variety of applications now is available in aerosol cans. This line consists of 47 different aerosol products.

Included in this line are code enamels in 19 colors; black and white marking enamels; and machinery primers, finishes, and enamels. Oil and graphite lubricants and penetrating oil are also included. Other items are clear plastic, blue layout fluid, battery terminal protector, anti-rust spray, and electric motor and engine degreaser.—**Sprayon Products, Inc.**, 2075 East 65th St., Cleveland 3, Ohio.



Improved Rock Drill

The improved Kent KS-48 rock drill weighs only 50 lb. It has three-speed operation, and the manufacturer says it performs effectively in a wide variety of rock.

The drill is made of heat treated steel, and the working parts are chrome plated. Another feature of this drill is the interchangeability of parts with other Kent tools.—**Kent Air Tool Co.**, Kent, Ohio.

ESSICK

VIBRATING COMPACTORS



Essick VR-28-W Self-Propelled Vibrating Compactor on Golden State Freeway

COSTS CUT IN HALF . . .

PRODUCTION TRIPLED . . .

SPECIFIED DENSITIES EXCEEDED . . .

**ESSICK 28" VIBRATING COMPACTOR OUTPERFORMS
OTHER EQUIPMENT ON SOIL OR ASPHALT**

Charlie Brown of the Chas. T. Brown Construction Company states:

"We were working on the Golden State Freeway in Los Angeles, compacting backfill around bridge abutments and drainage pipes. At the start of the job, compaction costs were running about \$1,300 per month per compaction unit which consisted of a compressor and three pneumatic tampers.

"Having successfully used Essick Vibrating Compactors on other projects, we felt that we could get better densities at less cost in the confined areas of this job with the Essick 28" self-propelled vibrating model.

"We put the Essick VR-28-W to work and cut monthly costs to about \$650 per compaction unit (about one-half), tripled our production, and exceeded our best past compaction performance. Being self-propelled, the Essick 28" Vibrating Compactor is just the ticket for backfill operations on soil and in hard-to-get-at locations. It gives the most compaction at the least expense, and exceeds specifications in record time."

Many Contractors are finding that the 865 lb. VR-28-W, with its High Frequency Vibration, exceeds the compaction of a sixteen-ton static roller on soil. This multiple purpose tool has also revolutionized highway maintenance by putting down better asphalt patches at greatly reduced costs. Carrying hooks make it completely mobile, and being self-propelled, it will go just about anywhere compaction is required.

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Also 14 Models of Tandem Rollers from 1/2 to 14 Tons

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6-8-7

New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

LUBRICANT PUMPS — Catalog No. 32 and Engineering Manual No. 33 by Lincoln Engineering Co. describes the company's newest line of 67 "Power-Master" air-operated lubricant pumps. The new line of pumps are now available in standard combinations on Lincoln's complete line of Lubrovans and Lubmobiles — the portable lube stations on wheels that carry complete lubrication systems into the field for on-the-job servicing of construction equipment. —Lincoln Engineering Co., 4010 Goodfellow Blvd., St. Louis 20, Mo.

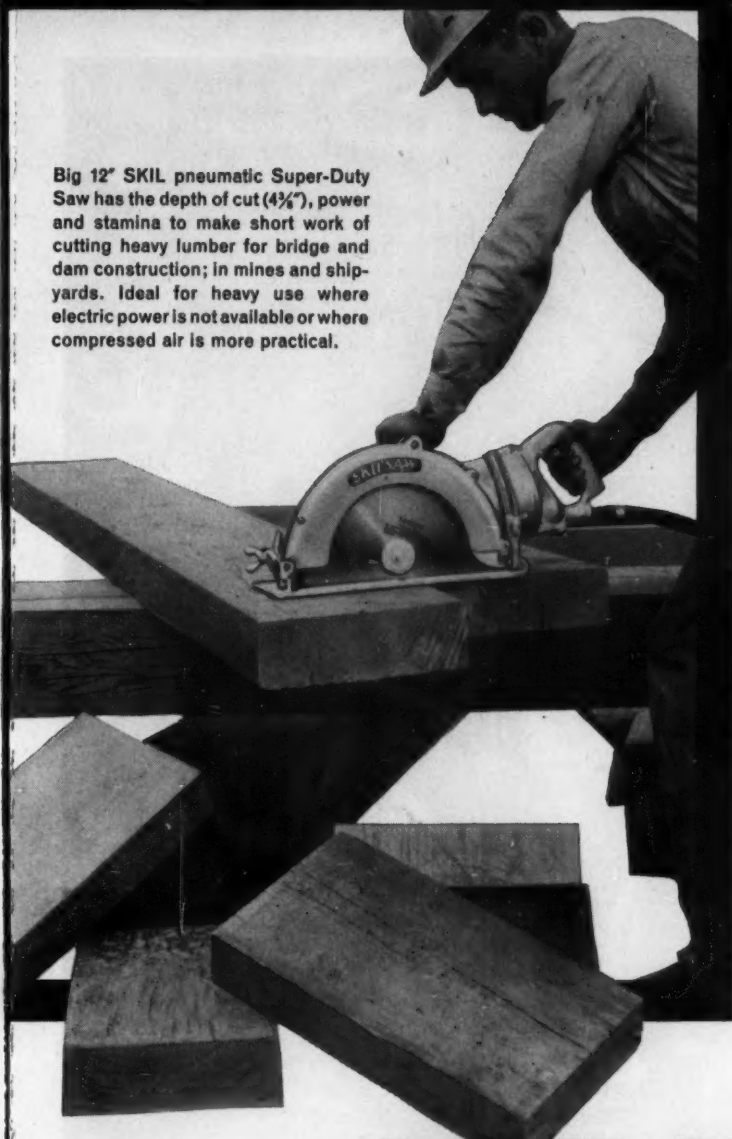
TRANSMISSIONS AND AXLES —Rockwell-Standard Corp. has issued two new field maintenance manuals to be installed in proper sequence in the set of manuals. No. 2 is entitled "Front Axles Non-Driving." No. 5A is entitled "Single-Reduction Hypoid-Drive Unit, Front-mounted, Through Drive Type." —Rockwell-Standard Corp., Transmission and Axle Division, Detroit 32, Mich.

LUBRICATION — Texaco publishes a regular magazine entitled "Lubrication—A Technical Publication Devoted to the Selection and Use of Lubricants." The May, 1959 issue, Vol. 45, No. 5 is devoted to "Power in a Small Package." It covers in considerable detail various aspects of the lubrication of small gasoline engines such as may be found on pumps, concrete buggies, portable saws and other small tools. —Texaco Inc., 135 East 42nd St., New York 17, N.Y.

OIL FILTERS—A 30-p booklet by Champion Laboratories represents a convenient cross reference book on oil filter replacement. The major section covers industrial, construction, and agricultural equipment, but there are also sections for trucks and passenger cars. Equipment is listed by manufacturer's name and model number. For each machine the numbers of the original element,

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rugged
day u
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where
and ea
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WI
Saws o
or mai
Catalog
SKIL

Big 12" SKIL pneumatic Super-Duty Saw has the depth of cut (4 $\frac{3}{4}$ "), power and stamina to make short work of cutting heavy lumber for bridge and dam construction; in mines and ship-yards. Ideal for heavy use where electric power is not available or where compressed air is more practical.



Just as this new super highway will cut off miles, the SKIL Model 77, 7 $\frac{1}{4}$ " Super-Duty Saw zips through heavy plywood and bracing used to make concrete forms. Its performance and dependability has earned the Model 77 a solid reputation as "standard equipment" for general contractors.



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When it comes to making the tough jobs easy, powerful SKIL Super-Duty Saws are in a class by themselves. They have the ruggedness and stamina to stand up under heaviest day after day use on toughest construction jobs. Yet they deliver exceptional high torque and big cutting capacity . . . ideal for use wherever "right-to-the-job" portability, dependability, power and ease of operation are required. And SKIL Super-Duty saws give you all these features; Job engineered, dual-handle cutting control, telescopic blade guards, *all* ball-bearing construction, adjustable bevel scale, stepped up power and speed.

Whatever your construction job, versatile SKIL Super-Duty Saws can help you finish "on schedule". See your SKIL dealer or mail coupon for free copy of the 58-page Industrial Power Tool Catalog, containing detailed information on SKIL saws and other SKIL Power Tools.



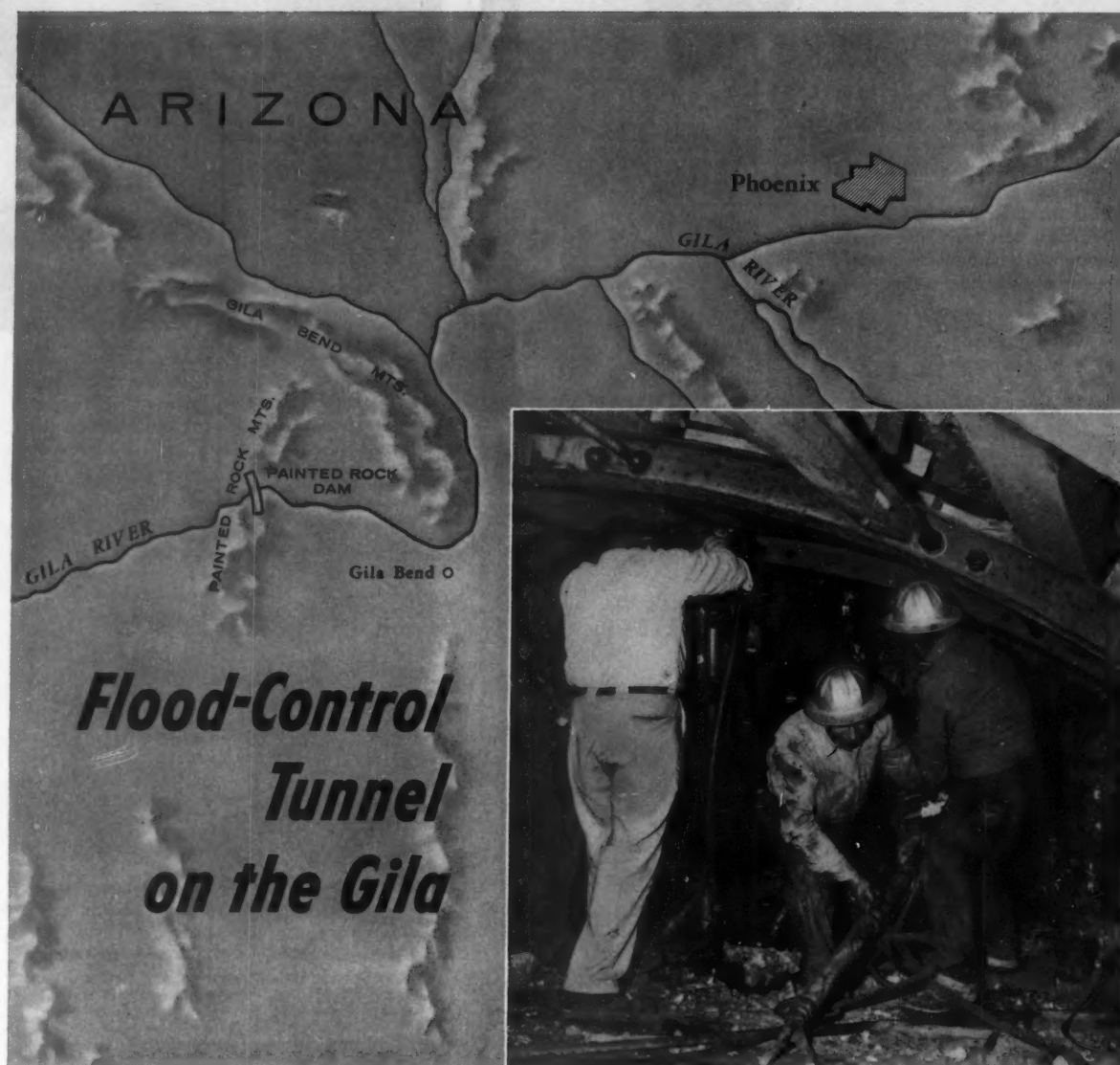
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Drill steel supplier: Brunner & Lay Co. of Los Angeles, Inc.; Drill steel reconditioner: D. W. Jaquay Co.; General contractor: Mitty Construction Co.

Using Bethlehem Hollow Drill Steel, this crew is drilling a blasting pattern for a 975-ft long, 25-ft diameter outlet tunnel, which is part of the Painted Rock Dam Flood Control Project on the Gila River, near Phoenix, Arizona. Under the direction of the U. S. Army Corps of Engineers, this project will provide protection against flash floods for some 300,000 acres of irrigated farm land, and will have a net storage capacity of 2,291,700 acre-feet.

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In any type of rock removal job, you can count on economical blast patterns with Bethlehem Hollow

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NEW PUBLICATIONS ...
continued

manufacturer's part number, and Champ-Kleen Pak number are given. — **Champion Laboratories Inc., West Salem, Ill.**

VALVE RECONDITIONING — A 28-p booklet by Black & Decker outlines the principles and practice of valve and valve seat reconditioning. The first part of the booklet describes the function of the valve and the importance of reconditioning. This is followed by a number of sections devoted to the techniques of reconditioning. Included topics are Carbon Cleaning, Principle of Collet and Pilot, Diamond Wheel Dressing, Valve Refacing, Squaring Tappets, and Valve Seat Grinding. The last part of the booklet describes Black & Decker equipment for this sort of work. — **The Black & Decker Mfg. Co., Towson 4, Md.**

VULCANIZING — Several pieces of literature are available from the Patch Rubber Co. to describe their products for chemical vulcanization. Two magazine reprints of articles by their technical director, William Hrubik, describes the basic process. Other folders describe Patch Rubber Co. products and kits. — **Patch Rubber Co., P. O. Box 933, Akron 9, Ohio.**

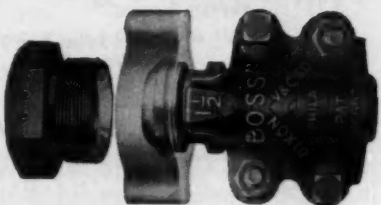
TRUCK MANUAL — The latest edition of the White Driver's Manual of truck owners, fleet superintendents, and drivers is now available. The 158-p manual is a compilation of authoritative motor truck data designed to help the truck driver keep his equipment operative. It was compiled with the aid of a nationwide study of drivers' problems and their solutions. Contents include sections on correct preparation, starting, taking-off, road practices, parking, and reference data on cooling systems capacities, electrical accessory loads, weights of commodities, etc. There also are several pages on which the driver can keep special information about his own vehicle. Price of the manual is \$1.25. — **Sales Promotion Department, The White Motor Company, 842 E 79th St., Cleveland 1, Ohio.**

PUMP SERVICE — The May issue of "Service Topics," published

*Safest Connections
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The original washerless coupling that is unequalled for safety in every high pressure service, and will therefore serve with exceptional efficiency and economy on all low-pressure applications. Built to withstand hard use and rough handling. Ground-joint union between stem and spud provides leak-proof, trouble-free seal...no lost or worn-out washers to replace. All parts malleable iron or steel, thoroughly rustproofed. Furnished with super-strong "Boss" Offset and Interlocking Clamps. Sizes 1/4" to 6", inclusive.

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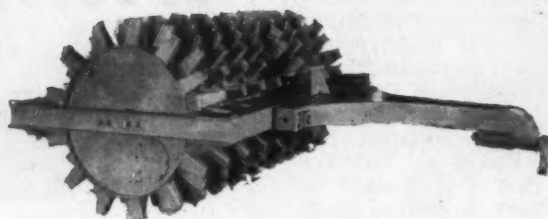
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NEW PUBLICATIONS . . .

continued

by the Detroit Diesel Engine Division of General Motors Corp. deals with the servicing of series 110 fresh water pump (curved vane impeller). To get your name on the mailing list for this regular publication contact the nearest GM Diesel outlet or write the factory direct. Subscription is free.—**Detroit Diesel Engine Division, General Motors Corp., 134000 W. Outer Drive, Detroit 28, Mich.**

REPLACEMENT PARTS—Three pamphlets by Columbia Steel Casting Co. describe their line of Armor-tough manganese steel replacement parts for various types of machines. Bulletin No. 1062 covers track shoes, dozer blades, end bits, and sprocket rims for tractors. Bulletin 1063 covers parts for crushers, shovels, tractors, buckets, and mining equipment. Bulletin 1067 covers teeth, bases, points, bushings, bucket fronts, repointers, and door accessories for shovels and buckets.—**Columbia Steel Casting Co., Inc., 933 N. W. Johnson St., Portland 9, Ore.**

CATERPILLAR BOOKLETS—Eight new booklets have been issued by the Caterpillar Co. "Time and Cost Record Book" and "Daily Work and Cost Record" are convenient record books for keeping track of individual machine performance. Booklet DE864, entitled "Money Saving Hints on Engine Reconditioning," offers tips on various operations that are necessary in reconditioning engines. Booklet DE853, entitled "Proof of the Difference," gives results of on-the-job comparative tests of Cat scraper and cutting edges. Booklet D868, entitled "Power and Guidance," gives design features of Cat sprockets and idlers. Booklet D905, entitled "Favorite of the West," gives job applications of Cat tractors in western United States. Form 33334 lists dry-type air cleaner change-over groups for D8 tractors bearing 13A, 14A, and 15A serial numbers, D9 tractors, 583 Pipelayers, and DW20 and DW21 tractors. Booklet D904, entitled "7+6+4=17," gives 17 reasons for working ability built into Cat D7, D6, and D4 tractors.—**Advertising Division, Caterpillar Tractor Co., Peoria, Ill.**

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Brings you simpler ways of appraising the many factors that influence the direct costs of labor, equipment, and materials—plus the indirect costs of insurance, taxes, bonds, supervision, overhead, and profit. Over 200 time-saving tables break

down operations into workable units such as the amount of materials needed for a certain job, the man-hours it takes, the hourly cost of owning and operating the equipment, etc. By R. L. Peurifoy, A. & M. Coll. of Texas. 2nd Ed., 446 pp., 83 illus., 220 tables, \$10.75.



CONSTRUCTION PLANNING, EQUIPMENT, and METHODS

A practical treatment of job planning, choice of equipment, and economical building methods, emphasizing the use of engineering methods in improving results and reducing costs. Covers topics from engineering fundamentals and job management to excavating equipment, drilling, blasting, tunneling, making and using concrete, and safety engineering. Includes scores of tables. By R. L. Peurifoy. 534 pp., 263 illus., \$8.50.

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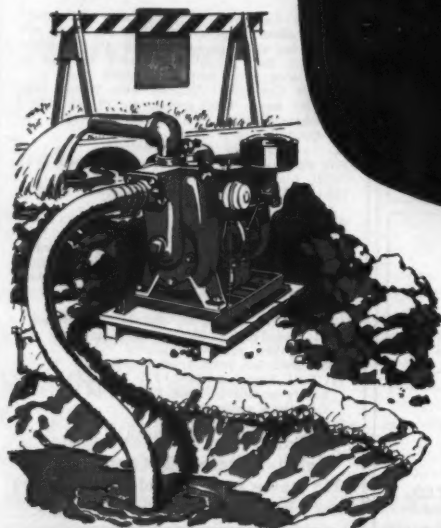
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A	
Aeroquip Corporation	24
Alemite Div., Stewart Warner Corp.	72-73
Allis-Chalmers Mfg. Co. (Construction Machy. Div.)	12-13, 46-47
(Engine-Material Handling Div.)	183
Allison Div., General Motors Corp.	80-81
Alloy Rods Co.	25
Aluminum Co. of America	160
American Bridge Div., U.S. Steel Corp.	208-209
American Chain & Cable Co., Inc. (Wright Hoist Div.)	232
American Hoist & Derrick Co. (Crosby-Laughlin Div.)	203
American Manganese Steel Div.	128
American Brake Shoe Co.	84-85
American MARC, Inc.	109
Aro Equipment Corp., The	224-225
Atlas Copco	105
Atlas Powder Co.	59
Austin-Western Works (Const. Equip. Div.) Baldwin-Lima-Hamilton Corp.	210-211
B	
Barber-Greene Co.	55
Bethlehem Steel Co.	236, 248
Blaw-Knox Co. (Construction Equipment Div.)	233
Boardman Co.	231
Bor Tun Co.	205
Boston Woven Hose & Rubber Co. Div. American Biltrite Rubber Co., Inc.	145
Broderick & Bascom Rope Co.	2nd Cover
Bucyrus-Erie Co.	87
Buffalo-Springfield Roller Co. Div. of Kochring Co.	32
Butler Bin Co.	6
C	
Case Co., J. I. (Industrial Div.)	135, 136-137, 138
Caterpillar Tractor Co. (Engine Div.)	36, 65, 103, 131
Champion Spark Plug Co.	140-141
Chevrolet Div., General Motors Corp.	44-45
Citico Service Oil Co. (Construction Machinery Div.)	58-59
Clark Equipment Co. (Construction Machinery Div.)	146-147, 148-149, 150-151
Cleveland Trencher Co.	223
Clevite Service, Cleveland Graphite Bronze Co., Div. Clevite Corp.	174
Clipper Mfg. Co.	186
Continental Motors Corp.	28
Construction Methods & Equipment	60-61
Contractors Service, Ltd.	202
Curtiss-Wright Corp. (South Bend Div.)	8-9
D	
D-A Lubricant, Inc.	130
Detroit Diesel Engine Div. General Motors	177
Diets Co., R. E.	173
Dixon Valve & Coupling Co.	249
Dodge Div., Chrysler Corp.	244
Douglas Fir Plywood Association	74-75
E	
Earnest Machine Products Co.	156
Eaton Mfg. Co., (Axle Div.)	180
Economy Forms Corp.	212
Emco Corp., The	3rd Cover
Electric Steel Foundry Co.	33, 34
Ellicott Machine Corp.	48
Essick Mfg. Co.	245
Euclid Div., General Motors Corp.	67, 68-69, 70
F	
Filotechnica-Salmiraghi, Inc.	250
Firestone Steel Products Co.	213
Ford Motor Co. (Ford Div.)	226
(Industrial Engine Div.)	190
Frederick Iron & Steel, Inc.	56
Fruehauf Trailer Co.	82-83
Fuller Mfg. Co.	184

G	
Galion Iron Works & Mfg. Co.	39
Gar Wood Industries, Inc.	218-219
Gardner-Denver Co.	71
GMC Truck & Coach Div., General Motors	112-113
General Tire & Rubber Co.	62
Goodall Rubber Co.	220
Goodrich Aviation Products, B. F. Div. The B. F. Goodrich Co.	200
Goodrich Industrial Products Co., B. F.	86
Goodrich Tire Co., B. F. Div. The B. F. Goodrich Co.	1
Goodyear Tire & Rubber Co. (Metal Products Div.)	19
Gorman-Rupp Co., The	5
Grace Mfg. Co., W. E.	250
Griffin Wellpoint Corp.	212
Gulf Oil Corp.	188-189
H	
Hartford Machine Screw Co. Div. Standard Screw Co.	172
Heltzel Steel Form & Iron Co.	207
Hendrickson Mfg. Co.	157
Hercules Powder Co.	38
Homelite Div., Texttron, Inc.	240
Hough Co., Frank G.	246
I	
Inslay Mfg. Corp.	155
International Harvester, Inc. (Construction Equipment Div.)	119, 120-121, 122-123
(Drott Div.)	124
(Farm Equipment Div.)	40-41
(Motor Truck Div.)	20-21
Iowa Mfg. Co.	127
J	
Jaeger Machine Co.	51
Johns-Manville	187
K	
Katolight Corp.	249
Koehring Div., Koehring Co.	30-31
Kohler Co.	252
L	
Laclede Steel Co.	230
Lehigh Portland Cement Co.	222
LeTourneau-Westinghouse Co.	161, 162-163, 164-165
Lima Works, (Construction Equipment Div.) Baldwin-Lima-Hamilton Corp.	204, 239
Lincoln Engineering Co.	179
Linde Co. Div. Union Carbide Corp.	79
M	
Macwhyte Wire Rope Co.	3
Marlow Pumps Div. Bell & Gossett Co.	64
Marquette Mfg. Co., Inc.	176
Master Builders Company, The	16
Mayo Tunnel & Mine Equipment Co.	241
McGraw-Hill Book Co.	251
Miller Tilt-Top Trailer, Inc.	194
Minneapolis-Moline Co.	23
Moretrench Corp.	29
N	
Neenah Foundry Co.	237
Noble Co.	142
Nordberg Mfg. Co.	168-169
Northwest Engineering Co.	7
O	
Oliver Corp., The	221
Owatonna Tool Co.	234
Owen Bucket Co.	185
P	
Pacific Mercury Mfg. Corp. (Joplin Div.)	212
Porter Co., Inc. H. K. (Thermoid Div.)	76
Purolator Products, Inc.	235
R	
Ramset Fastening System, Winchester Western Div. Olin Mathieson	206
Chem. Corp.	14-15
Raymond International, Inc.	238
Remington Arms Co., Inc.	238

Richmond Screw Anchor Co., Inc.	241
Rockwell Standard Corp. (Transmission & Axle Div.—Detroit)	49
(Universal Joint Div., Allegan, Mich.)	22
S	
Schild Bantam Co.	167
Seaman-Andwall Corp. Div. American-Marietta Co.	195
Sight Feed Generator Co., The	108
Sinclair Refining Co.	35
SKF Industries, Inc.	214-215
Skil Corp.	247
Smith & Co., D. B.	241
Soiltest, Inc.	237
Sprague & Henwood, Inc.	228
Standard Oil Co. of California	129
Standard Oil Co. of Indiana	26-27
Standard Steel Corp.	57
Stang Corp., John W.	175
Stoody Co.	118
Superior Concrete Accessories, Inc.	54
Symons Clamp & Mfg. Co.	2
T	
Texaco, Inc.	10-11, 66
Thew Shovel Co.	193
Timken Roller Bearing Company	4th Cover
Turbo Machine Co.	232
U	
Union Wire Rope Corp.	196-197
Unit Crane & Shovel Corp.	178
United States Rubber Co. (Mechanical Goods Div.)	42
(U. S. Royal Truck Tires)	152
United States Steel Corp.	208-209, 243
V	
Vickers, Inc.	229
W	
Waco Mfg. Co.	232
Waukesha Motor Co.	242
Wickwire Spencer Steel Div. The Colorado Fuel & Iron Co.	139
Worthington Corp.	56
Wright Hoist Div. American Chain & Cable Co.	232
Y	
Yale & Towne Mfg. Co., The (Trojan Div.)	198-199

CLASSIFIED ADVERTISING F. J. Eberle, Business Manager

Employment Opportunities	251
Equipment (Used or Surplus New) For Sale	251

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Methods Memo...

Will it Rain Today?

Every contractor knows how important weather information can be in scheduling construction work. But how many contractors know how to get the best up-to-the-minute weather reports?

Very few, probably, even though this service has existed for years. It's a radio network operated by the Federal Aviation Agency primarily for commercial and private plane pilots.

At 15 minutes and 45 minutes after every hour, 24 hours a day, the FAA stations broadcast a complete weather report for every area in the U. S. and its territories. The broadcasts at 15 minutes after the hour give the weather picture for an area of 80 to 100 miles around each station. At 45 minutes after the hour the broadcasts include weather conditions at major airports several hundreds of miles away in all directions.

These broadcasts all include special storm warnings giving the location and intensity of thunderstorms, line squalls, etc. with their direction and rate of movement. In addition, they give all the routine weather information—cloud conditions, ceiling, visibility, wind direction and velocity, temperature, dew point, and barometric pressure.

The FAA weather-reporting stations are in the 200-400 kc band. That's too low a frequency for most ordinary radios. But anybody can buy a small portable radio that will pick up these stations. Zenith and Motorola are two of the major manufacturers, and probably there are others, too. Prices start at about \$70.

Building Beauty with Dirt

City officials in Detroit figure dirt excavated for new expressways can be converted into various civic assets—at a saving of millions of dollars in the cost of the expressways.

Charles A. Blessing, director of the City Plan Commission, says the city should use the 60,000,000 cu yd of dirt that will be excavated for expressways by 1980 to build ski and toboggan hills in city parks, earth bowl amphitheaters, a better harbor, and a new island recreation area in the Detroit River.

He points out that the city is spending about \$1.65 cu yd to move dirt 10 miles or more to low lying areas outside the city. He estimates that shorter hauls would save at least \$25 million by 1980. At the same time, he says, the dirt would make Detroit a more beautiful and interesting city.

What's at Stake

Right now, when Congress and the Eisenhower Administration are at odds about how to raise the money to keep the highway building program rolling, may be a good time to take a look at what this program means to the construction industry.

The Bureau of Public Roads says there now are more than 5,200 contracting organizations actively engaged in building federal-aid highways.

Last year these contractors shared 11,102 federal-aid highway contracts (awarded through state highway departments) with a total value of \$3.8 billion.

Most of these contracts were small. Only 877 of them were for more than \$1 million, and nearly half of them were for \$100,000 or less.

These 1958 roadbuilding contracts represent an increase of about 50% in both the number of contracts and their dollar value over the 1957 totals. That gives a pretty good idea of what could happen if the stalemate in Washington is not resolved.

Plan Bulldozer

Any contractor can find out how he may participate in the construction industry's plan to lend a hand in disaster relief work by writing for a copy of the brochure, "Plan Bulldozer."

It was prepared by the Associated General Contractors of America and is available from AGC headquarters in Washington, D.C., or from any of the AGC chapters and branches. Participation is open to any contractor, whether affiliated with AGC or not.



New Use For Old Tires

Doyle Sanders, a blasting contractor of Athens, Ga., keeps a lot of worthless truck tires around and puts them to good use.

When he is blasting close to buildings, Sanders lays a cushion of 25 used truck tires over the shot hole and covers them with wire-cable mats. His blasts throw no rock at all, very little dust.

"We shoot as close as 2 ft from buildings," Doyle says, "and we haven't had so much as a broken window."

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Want all the facts? For comparative fact sheet, listing the vital statistics of all leading makes of tractors and front end loaders, write on your letterhead to Dept. AN-2, P. O. Box 300, Salt Lake City 10, Utah.

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8-435

"WE DRILL 15% MORE...AND DRILL IT FASTER... WITH TIMKEN CARBIDE INSERT BITS"

Special report from
H-E Lowdermilk, Inc.

LOCATION: U.S. HWY. 287,
LARAMIE, WYOMING

Operating conditions:
granite and schist

H-E Lowdermilk, Inc. of Virginia Dale, Colo., had to drill through hard abrasive ground—mostly granite and schist—in constructing U.S. Highway 287 between Ft. Collins and Laramie. So they chose Timken carbide insert bits and drilled 15% more feet-per-bit! And they drilled faster, too, because the Timken bits stayed sharper longer than other bits they had used.



Which Timken Bit should you use?

The Timken carbide insert bit is your most economical bit in hard, abrasive ground. But in softer ground, use the low-cost Timken all steel multi-use bit. And because both bits are interchangeable in the same thread series, you can switch bits when the ground changes. Dozens of different Timken bits fit the same drill steel. Both are made from Timken electric-furnace fine alloy steel, have special shoulder unions that protect threads against drilling impact. For help in selecting the right Timken bit for your job, phone or write: The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

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